

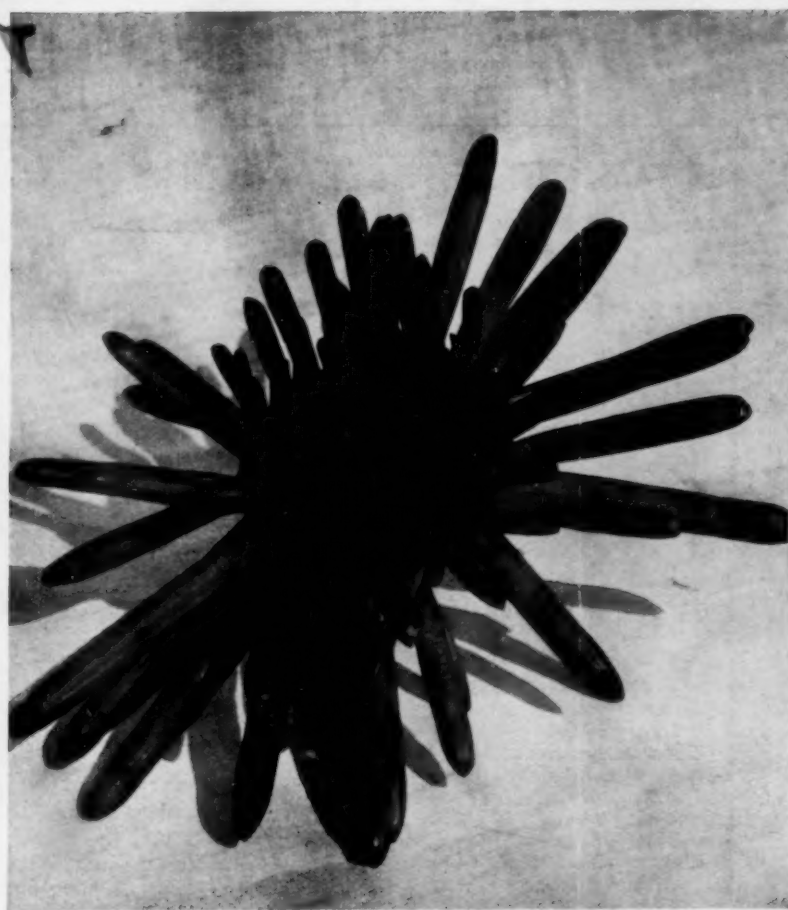
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# SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •



JANUARY 3, 1931

A Flower-Like Animal of the Sea

See Page 8

A

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Vol. XIX

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## DO YOU KNOW THAT

In one suburb of Berlin, there is a regulation which prohibits any woman from taking a child to board unless she has a diploma from a mothers' school.

A new type of electric gauge measures a hundred thousandth of an inch, and then magnifies the dimension 10,000 times so that a workman may quickly note the result.

A fir tree recently cut in Oregon had 838 annual rings, and charcoal records in the interior told of 12 forest fires it survived during the first 400 years of its life.

In comparison with the other continents of the world, Asia claims to have both the highest and the lowest places: Mt. Everest and the Dead Sea.

The life of cut flowers, fruits, and vegetables may be prolonged by storage in a carbon dioxide-treated atmosphere.

A study of some representative New Hampshire boys and girls showed that the great majority do not drink tea or coffee, but out of each 100 only 17 were drinking sufficient milk, only 21 a enough vegetables and only 34 a enough fruit.

Egyptian ladies shaded their eyelids with green malachite mixed in cosmetic preparations.

A curious outbreak of arsenical poisoning at Stoke-on-Trent has been traced to eating cough drops that had been dusted with arsenic trioxide.

## WITH THE SCIENCES THIS WEEK

ANIMAL PSYCHOLOGY			
See Without Visual Cortex	14	HORTICULTURE	
ARCHAEOLOGY		Poison for Poison Ivy	4
Adjustable Coffin	4	ICHTHYOLOGY	
Greek Ideas of Immortality	10	A Fish That Walks	5
Pueblo Ruins in Utah	9	IMMUNOLOGY	
ASTRONOMY		Typhus Fever Vaccine	14
First Pluto Pictures	10	MARINE ZOOLOGY	
Moon Affects Radio	5	Flower-Like Animals	8
Orion Now Conspicuous	11	MEDICINE	
Study Comets	8	Honored for Liver Cure	15
Sun Spots Due to Tide	5	Save Mothers and Babies	6
ASTROPHYSICS		METEOROLOGY	
Universe Not Running Down	3	English Rainfall Predicted	7
BACTERIOLOGY		ORNITHOLOGY	
Germ Generate Electricity	10	Tufted Titmouse	15
Invisible Period in Germ Life	6	PALEONTOLOGY	
BIOLOGY		Antelope Fossils	13
Two-Headed Baby	7	Dinosaurs' Farthest North	8
CHEMISTRY		PHYSIOLOGY	
Iodine in California	4	Circulation Rate Timed	8
Poison for Poison Ivy	4	Neurotic's Blood Differs From Normal	9
ECOLOGY		PLANT PHYSIOLOGY	
Ice Age Forest	10	Liver Makes Plants Green	8
ELECTRICAL ENGINEERING		PSYCHIATRY	
Edison Medal	6	Neurotic's Blood Differs From Normal	9
ENTOMOLOGY		PSYCHOLOGY	
New Insect Pest	8	Measures Moral Age	6
Taste With Legs	9	RADIO	
GENERAL SCIENCE		Moon Affects Radio	5
Athenaeum Opened	7	WOOD TECHNOLOGY	
First Glances at New Books	16	Combat Warping Wood	9
GENETICS			
Bred Just for Laboratory	9		

Science Service presents over the radio, an address

## THE MAGNETISM OF THE EARTH

By Dr. J. A. Fleming, Director of the Department of Terrestrial Magnetism of the Carnegie Institution of Washington.

Friday, January 9, 1931, at 3:45 p. m., Eastern Standard Time,

Over Stations of

The Columbia Broadcasting System

AAAS officers elected.....	23
Abbot, C. G. ....	99, 345
Accidents, auto, many.....	116
Accidents, mine.....	121, 132
Acid discloses ages of rocks.....	371
Acid, mountain soil is.....	264
Acid, phitic.....	41
Acorns and oaks.....	271
Actinic light in photography.....	84
Adams, E. Q. ....	158
Adams, W. A. ....	52
Adams, Walter S. ....	151, 339
Addison's disease.....	88, 216
Adolescence, psychology of.....	91, 109
Africa, hunting in.....	136, 248
African gold mines diminishing.....	118
Age, moral, measured.....	6
Age of earth.....	163
Age, salvaging old.....	181
Aged, speed and efficiency of.....	239
Agriculture award, Capper.....	409
Aharoni, I. ....	297
Ahrens, Theodor.....	183
Air currents at Rock of Gibraltar.....	365
Air, upper, studied.....	316
Airplane engines, hotter.....	265
Airplane flight six miles high planned.....	360
Airplane lion hunting forbidden.....	248
Airplane noise, silencing.....	79
Airplanes.....	297, 316, 355
Airship line, trans-oceanic.....	100
Airship mast, Manhattan, questioned.....	89
Alaska lighthouse sliding.....	233
Albright, Horace M. ....	239
Albright, W. F. ....	41
Alden, W. C. ....	271
Aldrich, Cecilia G. ....	398
Alkalinity, blood and cancer.....	294
Allen, Chauncey N. ....	200
Allen, E. T. ....	278
Allen, Maxwell W. ....	387
Allison, Fred.....	307
Allport, Floyd H. ....	169
Alpha-rays, 2,000 volts produce.....	296
Alphabet, Canaanites used.....	103
Altberg, W. ....	147
Alter, Dinsmore.....	5, 7
Altitude, high, plans to reach.....	360
Aluminum, history of.....	171
Aluminum prevents warping.....	9
American Chemical Society meeting.....	212
Ames, Joseph S. ....	355
Amyl ethyl barbituric acids.....	265
Anaplasmosis, cattle disease.....	302
Ancient man and ostrich.....	213
Anderson, Almeda.....	9
Anderson, J. B. ....	316
Anderson, R. J. ....	41
Andrews, D. H. ....	35, 262
Andromeda Nebula.....	339
Anemia cure, seek cheap.....	15
Anemone.....	318
Anesthetics.....	214, 265
Animal distribution and cold.....	175
Ant eaters, human.....	238
Antares, new observation of.....	237
Antelope fossils in Texas.....	13
Anti-freeze, poison from.....	302
Antiseptic claims disputed.....	248
Antitoxins, artificial.....	409
Antoniadi, E. M. ....	85
Apatite crystals, tooth enamel of.....	357
Ape fossils in Holland.....	169
Ape, monkey clever as.....	329
Appalachian shrubs.....	249
Appendicosis, new disease reported.....	392
Archaeological find, Egyptian.....	89
Archaeologists, engineers cooperate with.....	271
Archaeology, Sumerian-Shurruk.....	201
Archaeology, Trier, excavations at.....	249
Architecture, new.....	260, 324
Arctic inhabitants, oldest, search for.....	313

Arctic islands, Canadian title to.....	41
Arizona, Indian ruins.....	287
Arizona meteor study.....	317
Art, ancient, of West Indies.....	68
Artistic talent of children, tests reveal.....	310
Ashville, N. C., tunnel.....	157
Asteroid 433: Eros.....	59
Asteroid, new.....	190, 216
Asthma.....	77, 361
Aston, A. C. ....	404

## SCIENCE NEWS LETTER

*The Weekly Summary of  
Current Science*

### Index

VOL. XIX

Numbers 508 to 533

Jan. to June, 1931



Published by

**Science Service**  
Washington, D. C.

Aston, F. W. ....	83
Astronomical anniversary, triple.....	165
Astronomy medal, 1931.....	156
Athenaeum, new California.....	7
Atom-building cause of ultra-X-radiation.....	287
Atom, study of.....	35, 199, 217, 266, 294, 413
Atomic weights.....	230
Attitude important in learning.....	87
Attitude test for movies.....	343
Aub, Joseph C. ....	334
Aurora Borealis.....	45, 356
Australian game protection.....	307
Auto knock photographed.....	238
Auto knock studied.....	212
Auto parking, automatic.....	280
Autogyro, improved.....	323
Autos kill more than war.....	116
Autosynthetic cells.....	20
Aviation develops Canada.....	36
Award in mustard gas contest not made.....	360
Aztec idols, soldiers find.....	104
Aztec temple, round.....	115
Aztec town explored.....	261
Babies, Fiji, fed coconuts.....	351
Babies, mental growth of.....	119
Babies, protecting, from tuberculosis.....	358
Baby, two-headed.....	7
Babylon, Nabonidus of.....	54
Baby's stomach relieved by X-rays.....	588
Bacchus statue at Trier.....	249
Bacteria, type G, resists bacteriophage.....	6
Bacteriophage, type G, germ resists.....	6
Badger, L. F. ....	115, 157
Bagge, G. F. ....	202
Bailey, Vernon.....	333
Baker, E. A. ....	245
Baker, R. A. ....	216
Baking test for newsprint.....	137
Balloon flight successful.....	364
Balyeat, Ray M. ....	220

Bancroft, W. D. ....	214, 275
Band, William.....	315
Barborka, Clifford J. ....	376
Barbour, Orville.....	388
Barnes, Howard T. ....	69
Bateman, Harry.....	308
Batfish, walking.....	5
Bauer, W. C. ....	77
Bauer, Walter.....	334
Bayer's "Uranometria".....	11
Beacon, new floating.....	295
Beam, strange blue-white.....	45
Bears.....	169, 404
Beattie, R. Kent.....	168
Beaucatcher tunnel.....	157
Beck, Leo L. ....	83
Beck, Samuel J. ....	147
Becker, Thomas A., cup.....	343
Beehives, orchard disease in.....	345
Beer-making 8,000 years ago.....	378
Beard, Richard O. ....	376
Bees travel far for honey.....	168
Beetle, Japanese, destroyed by worms.....	376
Behavior, individual and social.....	169
Behavior test, Rorschach.....	147
Benedict, F. G. ....	197
Berger, Samuel.....	409
Bernheim, Bertram M. ....	315
Bernsen, J. J. A. ....	169
Bernton, Harry S. ....	367
Beryl crystal, large.....	45
Bezi, Istavan.....	404
Biesbroeck, George Van.....	179, 345
Bird nest in hare skin.....	153
Birds.....	24, 301, 350
Birth, difficult, may cause dullness.....	390
Bishop, Edna R. ....	307
Bittinger, Charles.....	374
Blakeslee, Albert F. ....	26
Blanc, Gian Alberto.....	281
Blindness.....	142, 234, 245, 396
Blom, Franz.....	299
Blood alkalinity and cancer.....	294
Blood circulation.....	8, 9, 120, 315
Blood pressure, high, cause before cure.....	376
Blood transfusion.....	264, 276
Boas, Franz.....	23, 390
Bobrovnikoff, N. T. ....	8
Bobwhite, cornshocks save.....	217
Bomb, new aerial gas.....	102
Book of the Dead, Egyptian.....	166
Books, air conditions affect.....	120
Booster invented by States.....	345
Borodin, Dmitry N. ....	63
Boron, discovery of.....	171
Botanical museum, new.....	57
Bottle drifts.....	168, 200, 244
Bower, E. C. ....	413
Bowles, Gordon Townsend.....	360
Bowyer's tree—the yew.....	175
Boyd, T. A. ....	212, 238
Brain.....	120, 275
Brain, circulatory system in.....	120
Brains, sleep requires.....	300
Brasch, A. ....	403
Bray, C. W. ....	312
Bray, M. E. J. Gheury de.....	260
Breasted, James H. ....	89
Erebner, William B. ....	250
Breuil, Abbé.....	88
Brickwedde, F. G. ....	243
Bridgman, P. W. ....	348
Brill, A. A. ....	372
Britton, S. W. ....	216
Britons, ancient, homes of.....	205
broadcasting synchronized.....	39
Bronfenbrener, J. ....	228
Bronzes.....	39, 215
Brooks, Charles F. ....	45, 84, 180
Brown, A. Lincoln.....	264
Brown, Barnum.....	250, 387
Brown, E. W. ....	163



Brown, Robert A. ....	202	Child psychology. ....	137, 147, 165, 198, 312	Crayfish .....	388
Browne, William M. ....	110, 216	Childe, V. Gordon. ....	205	Creeping paralysis. ....	312
Brownell, Katherine A. ....	88	Children, crippled. ....	138, 165	Crile, George W. ....	20, 293
Bruce, Catherine Wolfe, medal. ....	156	Children, growth. ....	280	Crime a disease. ....	232
Brüche, Ernest. ....	388	China knife-marked. ....	265	Crime news, less published. ....	73
Bryan, Bruce. ....	269	Chiniofon relieves dysentery. ....	264	Criminals, "repeater," tested. ....	117
Bryce Canyon Park. ....	40	Chlorophyll and hemoglobin. ....	8	Crippled children. ....	138
Budgets, museum, increase. ....	409	Christie, William H. ....	151	Cripples, psychology aids. ....	165
Buffalo gnats kill mules. ....	329	Chromium electroplating. ....	202	Crop loss from insects. ....	324
Bug, Panamanian. ....	244	Cicada nymphs in Florida. ....	8	Crops, January drought threatens. ....	90
Buhler, Charlotte. ....	119	Cirrhosis of liver. ....	213	Cross-eyes, correcting. ....	165
Bullfrogs tone-deafen. ....	312	Civilization, future. ....	22	Crothers, Bronson. ....	158
Burgess, Alex M. ....	213	Clark, Herbert C. ....	110	Crow-eating fishermen. ....	183
Burnett, David. ....	38	Clark, L. Pierce. ....	361, 383	Crum, L. V. ....	333
Burney, Sydney. ....	281	Clark, Norman Ashwell. ....	153	Crystal, large beryl. ....	45
Burton, H. E. ....	73, 216	Claude, Albert. ....	185	Crystal structure reveal by electron waves. ....	409
Burrage, Albert C. ....	295	Clawson, Benjamin J. ....	237	Culler, Elmer. ....	9
Business depression. ....	40	Clayton, H. H. ....	99, 170	Cumming, Hugh S. ....	302
Business, psychology in. ....	106	Climate and carbonic acid. ....	278	Cummins, C. L. ....	135
Buss, Leo E. ....	7	Clock, new precision. ....	143	Cup, Thomas a Becket. ....	343
Butin, Romain. ....	103	Clunk, J. F. ....	245	Curtis, Heber D. ....	282
Butter vs. palm oil. ....	38	Clyde, George D. ....	118	Curtis Condor airplane. ....	79
Butterfly taste acute. ....	9	Coal, formation of. ....	153	Curvature of earth, proof of. ....	24
Byck, Harold T. ....	118	Coastal erysipelas. ....	319	Cutlery marks on china. ....	265
Byerly, Perry. ....	281	Coblentz, W. W. ....	227	Cuyler, Robert H. ....	201
		Cockerell, T. D. A. ....	89		
Cable, high message capacity. ....	77	Coconuts, Fiji babies fed. ....	351	Dahl, Odd. ....	19, 326
Cactus, pearls from. ....	25	Cod-liver oil. ....	180	Dakin, H. D. ....	15
Cadmium, discovery of. ....	75	Codfish rivalled as vitamin source. ....	281	Dalton, John. ....	187
Cahokia Indian cemetery. ....	296	Coffin, adjustable, at Tell Billa. ....	4	Dart, F. Sheldon. ....	184
Cain, Stanley A. ....	249, 264	Cogolludo, Diego. ....	298	Davenport, C. B. ....	205, 280
Calbick, C. J. ....	296	Cohen, Barnett. ....	10	Davis, A. H. ....	377
Calcium chloride for colic. ....	334	Cohn, E. J. ....	15	Davis, N. S., III. ....	376
Calcium, deficiency of, in youth. ....	408	Cold and magnetism. ....	169	Davis, Tenney L. ....	216
Caldwell, O. H. ....	101	Cold, fungus spores resist. ....	53	Davison, Wilbur C. ....	132
Calendar reform. ....	67	Cold, Polar, and animal distribution. ....	175	Davisson, C. J. ....	296, 409
Calixtlahuaca excavations. ....	115, 261	Cole, Fay-Cooper. ....	271	Dayton, Neil A. ....	390
Calmette, Alfred. ....	358	Colic, salt injection relieves. ....	334	Dayton case sequel. ....	196
Campbell, Leon. ....	73, 200	Collier trophy. ....	323	Deaf persons mannerisms. ....	377
Campbell, William Wallace. ....	52, 291	Collingwood, R. G. ....	249	Deafness. ....	168, 373, 376
Canaanites used alphabet. ....	103	Collins, William F. ....	215	Dean, R. S. ....	323
Canada, airplane develops. ....	36	Color, adaptive. ....	47	Dearborn, George V. ....	406
Canada's arctic claims. ....	41	Color blindness. ....	187, 217	Death and loss of sight of equal value. ....	374
Canadian weather, India affects. ....	84	Comet, Neujmin's, sought. ....	335	Debenham, Martin Warren. ....	264
Cancer. ....	40, 57, 215, 294, 356, 396	Comet or planet, Nakamura? ....	179	Deer, National park. ....	201
Candolle, Alphonse de. ....	251	Comet, Schwassman-Wachmann. ....	345	Dementia praecox. ....	67, 300
Canned food, rats thrive on. ....	216	Comets, study of. ....	8, 292	Dempster, L. E. ....	229
Cannon, Walter B. ....	392	Compass, new electron, without magnet. ....	388	Densmore, Frances. ....	79, 137
Canyon de Chelly. ....	152	Compton, A. H. ....	211, 294	Depression. ....	40, 118
Capper agriculture award. ....	409	Compton, Karl T. ....	355	Desjardins, Arthur U. ....	404
Carbohydrates for liver disease. ....	213	Conard, H. S. ....	93, 183	Deuel, Thorne. ....	381
Carbon monoxide, eliminating. ....	294	Conduct and scholarship. ....	14	DeVries, Thomas. ....	212
Carbonic acid and climate. ....	278	Congress, last minute bills of. ....	164	Dewar, James. ....	169
Carotin gives vitamin A. ....	236	Conrad, Frank. ....	6	Dextrose, calories in. ....	56
Carr, W. H. ....	179	Conservation, Australian game. ....	307	Diamonds set in rubber. ....	154
Carrot, use found for wild. ....	79	Constable, J. E. R. ....	199, 266	Dickinson, H. C. ....	243, 363
Carville, La., Leprosarium. ....	120	Converting light to electricity. ....	227	Diesel racer. ....	135
Castaneda, M. Ruiz. ....	14	Cook, W. ....	243	Diet not cause of cancer. ....	356
Cat, sleepy. ....	335	Coolants for airplanes. ....	265	Dietrich, W. C. ....	276
Catalpa trees. ....	366	Cooling prevents rock falls. ....	121	Diets, U. S., lack vitamins. ....	236
Catbird. ....	414	Cooling towers, concrete. ....	261	Digestive power of trypsin. ....	184
Cattle disease, tropical. ....	302	Cooper, William S. ....	10	Dinosaur eggs. ....	40, 377
Causality vs. uncertainty. ....	211	Copper oxide cell. ....	227, 234	Dinosaurs. ....	8, 24, 150, 249, 328
Cause and effect, limitations to. ....	348	Corey, Stephen Maxwell. ....	217	Dionysos, Greek god. ....	214
Cavern, rock engravings in French. ....	88	Corinthian graves. ....	10	Diphtheria, preventing. ....	404
Cells, artificial. ....	20, 293	Corn. ....	21, 308	Disease germs generate electricity. ....	10
Cells, young, X-ray destructive to. ....	404	Corn, sugar. ....	56	Disease, plant, causes fever. ....	100
Cellulose destroyed by wood pulping. ....	381	Cornshocks save bobwhite. ....	217	Diseases. ....	6, 71, 72
Centipede, house. ....	78	Cornstalk product, maizeolith. ....	73	Diseases, X-ray treatment. ....	404
Chadwick, J. C. ....	199, 266	Corona, sun's. ....	131, 133	Dog guides for blind. ....	245
Chalmers, William J. ....	45	Cortical extract, cats test. ....	216	Dolls, ancient Egyptian. ....	200
Chamberlain, T. C. ....	62	Cortin effective for Addison's disease. ....	88	Domm, L. V. ....	21
Chambers, Moreau B. ....	313	Cosmic rays. ....	248, 287	Dopes for motor fuel found useless. ....	363
Chan-Chan, Peru, ruins. ....	372	Cotton, Richard T. ....	151	Dougherty, Raymond P. ....	54
Chant, C. A. ....	24	Cotton, Indians cultivated. ....	239	Dove, W. Franklin. ....	9
Chara, ancient plant. ....	143	Cottrell, F. G. ....	283	Doyle, T. M. ....	44
Chemical music. ....	262	Couch, James F. ....	414	Draper, Henry. ....	23
Chemist or drug stores. ....	201	Counterfeiting, ancient. ....	136	Drivers tests. ....	325
Chestnut, Japanese, crop. ....	168	Coyotes. ....	104, 184	Drought. ....	90, 159, 170, 313
Chevassut, Kathleen. ....	312	Crabs, spider. ....	127	Drug addition. ....	90, 190
Chickens, breeding laboratory. ....	9	Crafts, Leland W. ....	265	Drug or chemist stores. ....	201
Child health conference, White House. ....	158	Craig, Homer. ....	217	Drunkenness, test for. ....	212

88	Dublin, Louis I. ....	6	Equinox, magnetic storms frequent at... ..	295	Flvers, insect. ....	246
12	DuBridge, L. A. ....	42	Ergot, laboratory grown. ....	206	Flying, night, thunderstorms trouble. ....	396
93	Ducks as flying machines. ....	301	Eros. .... 59, 73, 87, 110.	200	Flying upside down, Bird. ....	88
32	Dullness caused by difficult birth. ....	390	Errington, P. L. ....	217	Foggiest spot in U. S. A. ....	115
73	Dulong, Pierre Louis. ....	230	Erysipelas, coastal. ....	319	Fogs, few natural in England. ....	348
17	Dunes threaten forest. ....	217	Eskimo houses. ....	207	Folsom, New Mexico, finds at. ....	387
38	Dunham, J. L. ....	45	Essex, H. E. ....	136	Foods, new way of irradiating. ....	94
65	Dushman, Saul. ....	212	Etheridge, W. C. ....	120	Foods, protective. .... 58, 123.	265
24	Dutch East Indies, rubber oil from. ....	117	Ethnobotanical Museum. ....	57	Forbes, D. L. ....	179
90	Dyer, R. E. .... 115,	157	Ethylene oxide. .... 4.	151	Forbes, W. H. ....	132
65	Dysentery, amebic, medicine for. ....	264	Euler (German chemist). ....	236	Ford, James A. ....	313
58			Eustis, Allen. ....	213	Forest remains studied. ....	10
83	Eagle, I. O. ....	228	Eustis, Dorothy Harrison. ....	245	Fossil antelopes in Texas. ....	15
33	Eagle, sea, eats mice. ....	297	Evans, Frank A. ....	269	Fossil birds of Florida. ....	350
45	Eakin, J. Ross. ....	201	Evans, G. C. ....	40	Fossil, contemporary. ....	143
109	Ear, inner, photographs. ....	293	Everglades park bill. ....	116	Fossil flowers. ....	206
9	Ears, study of, after death. ....	373	Everglades tribe traced. ....	325	Fossil horses in Oregon. ....	254
02	Earth, age of. ....	163	Evershed, Sydney. ....	88	Fowl pox vaccine. ....	44
35	Earth, carbonic acid keeps warm. ....	278	Evolution and health level. ....	151	Fowler, R. H. ....	212
43	Earth, curve, pictured. ....	24	Evolution, controlling. ....	328	Fox, Arthur L. ....	249
82	Earth origin theory. ....	62	Evolution law, Tennessee. ....	196	Freak, two-headed. ....	7
79	Earthquake engineering. ....	106	Ewing, James. ....	71	Freeman, G. LaVerne. ....	261
24	Earthquake observatory, new. ....	394	Examinations, uniform college. ....	328	Freeman, John. ....	367
65	Earthquakes. .... 56 93 104, 105, 234,	297	Exercise and reducing. ....	297	Freeman, Walter. ....	67
01	Earthquakes, study of. .... 281, 387,	389	Exercise, forced, and learning. ....	217	Freud, J. ....	205
	Earths, rare. ....	314	Exuma Sound expedition. ....	152	Freudenberg, Wilhelm. ....	276
26	East, E. M. ....	22	Eye color. .... 189, 295		Friday, 13th, astronomers celebrate. ....	165
15	Easter, first, date of. ....	214	Eyeglasses, new type of. .... 185,	296	Fritz, Emanuel. ....	324
87	Eberson, Frederick. ....	394	Eyes, cross, corrected. ....	165	Fry, Edith G. ....	294
84	Eclipse, lunar, Jan. 15, 1931. ....	237	Eyes, toad's. ....	232	Fuchs, E. A. ....	131
80	Eclipse, 1932, plans for photographing. ....	374	Ezekiel, Walter N. ....	100	Fuchs, John Philip. ....	264
77	Eclipses, Mayas predicted. ....	376			Fuel, auto and plane, non-explosive. ....	361
76	Eclipses, 1931. .... 11,	237	Failla, G. .... 150, 393		Fulton, J. A. ....	312
16	Economics of depression. ....	40	Family influence. ....	56	Fungus .... 53,	259
32	Eddy, Nathan B. ....	90	Fassig, C. L. ....	316	Fungus attacks redwoods. ....	324
09	Eddy, W. H. .... 216,	236	Fat and good nature. ....	312	Fungus causes disease like TB. ....	36
90	Edeberg, A. G. ....	314	Fat, excess, changed to sugar. ....	313	Furlong, Eustace L. ....	408
96	Edison medal, 1930. ....	6	Fat hibernating insects. ....	184	Furs, winter. ....	47
77	Edmunds, C. W. ....	90	Faull, Anna F. ....	53	Futcher, Thomas B. ....	269
76	Education of left-handed. ....	136	Feeble-minded, training of. ....	398	Future, uncertainty of. ....	195
23	Edwards, A. S. ....	88	Feldheiser, Charles. ....	87		
06	Eggs hatched by natural heat. ....	313	Fellowships, Research council. ....	155	Gadolin, Prof. ....	314
74	Eggs, mineral oil preserves. ....	325	Fenton, Carroll Lane. .... 151,	280	Gaines, Newton. ....	179
64	Egypt, stone age town in. ....	243	Ferry, Newell S. ....	344	Gall bladder X-rays. ....	148
01	Egyptian burial, clay hands et. ....	173	Fever in sick plants. ....	100	Game refuge, western. ....	333
00	Egyptian dolls, old. ....	200	Fevold, H. L. ....	21	Gamma rays. .... 135,	393
29	Egyptian guide to Heaven. ....	166	Fick, A. E. ....	185	Gangrene treatment, new. ....	315
37	Egyptian tomb, important. ....	89	Field, Henry. ....	184	Garber, R. J. ....	21
18	Egypt's calendar, flowers check. ....	28	Field Museum Mayan expedition. ....	58	Garner, Clem L. ....	297
04	Ehrlich, Paul. ....	409	Fielding, Una. ....	120	Garrison, F. Lynwood. ....	118
81	Einstein, Albert. .... 7, 51, 107,	195	Fig tree, origin of. ....	251	Gas attack, vegetable. ....	193
12	Einstein theory amplified. ....	315	Fiji babies fed coconuts. ....	351	Gas made non-poisonous. ....	294
69	Elderkin, Kate McK. ....	200	Finger nails, losing. ....	392	Gas masks, New. ....	102
56	Electric current, smallest. ....	42	Fire blight from beehives. ....	345	Gas, new insecticide. ....	151
54	Electric peak in Yellowstone. ....	105	Fischer, A. W. ....	148	Gas, poison, defense against. ....	186
63	Electrical precipitation of dust. ....	283	Fischer, Franz. ....	294	Gases, nebulae composed of. ....	395
35	Electricity. .... 10, 89, 227,	403	Fish, C. J. ....	87	Gasoline dopes useless. ....	363
56	Electricity, cost, read in cents per hour. ....	372	Fish, air-breathing. .... 25,	102	Gatherwood, Florence. ....	255
76	Electricity treatment for multiple scler. ....		Fish blood, phosphorus in. ....	173	Gay-Lussac and Thenard. ....	171
36	Electro-magnet installed at Leiden. ....	393	Fish-catching spider. ....	131	Gaza, Palestine, secret tunnel of. ....	233
84	Electron waves reveal crystal structure. ....	409	Fish flour, valuable food. ....	254	Geiger, Paul H. ....	227
77	Electrons in harness. .... 101, 296, 348,	349	Fish, new mouth cut in. ....	105	Geikie, Archibald. ....	331
28	Element No. 85 detected. ....	307	Fish, Siamese, shoots water. ....	150	Gellanders, G. ....	168
14	Elephant hunting costly. ....	136	Fish, walking. ....	5	Gene, theory of the. ....	43
04	Elephant's tooth dates ancient m'n. ....	276	Fish, weed "horn" kills. ....	277	Generator, mercury vapor electric. ....	415
10	Elevator, new system. ....	63	Fish yield vitamins. ....	281	Gent, H. van. ....	232
70	Eliot, Martha M. ....	180	Flatworms, magnetism heals. ....	28	Geology, vegetation reveals. ....	201
72	Ellis, Ruth H. ....	255	Fleas and typhus fever. ....	115	Geraniums ....	30
04	Film, historic. ....	142	Fletcher, J. H. ....	121	Gerhardt, D. Oswald. ....	214
00	Emmet, W. L. R. ....	415	Flinn, Frederick B. ....	408	German colony in Yugoslavia. ....	280
21	Emotion and mental efficiency. ....	264	Florida birds. ....	350	German Mythology—Hengist and Horsa. ....	137
53	Emotions and coloring. ....	295	Florida Indians. ....	74	Germs become filterable. ....	6
34	Empire State Building. ....	89	Flower, Paschal. ....	223	Germs generate electricity. ....	10
9	Employment, women in. ....	334	Flower, Walter E. ....	138	Germs, sound kills. ....	179
44	"Empress of Britain," beacon. ....	295	Flowers, fossil. ....	206	Germs weakened before antiseptic test. ....	248
23	Emulsion, new fast photographic. ....	105	Flowers, ice defying. ....	281	Gershon-Cohen, J. ....	148
00	Enamel, tooth, of apatite crystals. ....	357	Flowers, March snows and. ....	186	Geysers, Yellowstone. ....	278
25	Engines, airplane, hotter. ....	265	Fluorine causes spotted teeth. ....	308	Gibraltar, Rock of, air currents. ....	365
30	Environment cause of mental ills. ....	377	Fly, Claude L. ....	153	Gilchrist, H. L. ....	102
03	Environment in evolution. ....	328	Fly, strange species. .... 68,	127	Gillett, Glenn D. ....	39
01	Epilepsy. .... 280, 371,	391	Fly trap, tsetse. ....	233	Gilmore, Charles W. .... 150, 203,	328
2	Epinephrin measures circulation. ....	8			Gilmore, Melvin R. .... 57,	109

Ginger paralysis.....	56	Heat, effect of, on molecules.....	118	Immunity, snake poison.....	136
Giza excavations, New.....	173	Heats, specific.....	230	Indian cemetery, Cahokia.....	296
Glacial Age, four cycles in.....	89	Heaven, Egyptian guide to.....	166	Indian monument, earth lodge.....	109
Gland extract, parathyroid.....	408	Heck, N. H.....	106, 234	Indian mound studied.....	73
Glands.....	21, 137, 158, 328	Height, Harvard men, comparison of.....	360	Indian site, Illinois, found.....	339
Glaser, R. W.....	376	Heilbron, I. M.....	236	Indian songs recorded.....	137
Gliders, first type of airplane.....	246	Heine, Leopold.....	185, 296	Indian tipi-shaking.....	79
Glochidia, tiny mussels.....	40	Heisenberg, W.....	195, 211	Indian tomb, Canada.....	201
Gnats kill mules.....	329	Helium liquefied.....	243	Indians, Arizona, cultivated cotton.....	239
Goitre.....	245, 269	Helmer, O. M.....	185	Indians, Florida.....	74, 325
Gold source diminishing.....	118	Hemenway, Ansel F.....	25	Indians of Pacos.....	71
Goldfish, learning of.....	41	Henshaw, P. S.....	150, 393	Indians originally peaceful.....	47
Gomberg, Moses.....	199	Heredity.....	26, 43, 189, 351	Infant welfare bill.....	62
Gooderham, C. B.....	168	Herrington, L. P.....	309	Infantile paralysis.....	250
Goodyear, Charles.....	154	Herriott, M. E.....	87	Influenza.....	53, 105
Gordon, Burgess.....	329	Herschell, William, anniversary.....	165	Ingalls, H.....	200
Gorilla embalmed.....	46	Hess, Viktor.....	248	Ink blots used for personality study.....	406
Gorton, A. F.....	277	Hetler, D. M.....	228	Inoculation no cure for asthma.....	361
Gottschee Germans.....	280	Hewlett, C. W.....	25	Insanity.....	266, 275, 300
Grafton, Lewis G.....	118	Hicks, J. Allan.....	198	Insecticide, new gas.....	151
Grant, Robert J.....	118	Hides, stain on, caused by sea salt.....	366	Insects.....	8, 184, 246, 324
Graves, William W.....	37	High blood pressure, cause before cure.....	376	Insulation, ice box.....	313
Graves and immortality, Greek.....	10	High altitude, plans to reach.....	360	Intestines, x-rays of.....	148
Gray, Hawthorne C.....	364	Hill, Leonard.....	356	Iodine found in California.....	4
Green, J. J.....	297	Himwich, Harold E.....	312	Ions, million volt, produced.....	296
Greenbaum, Frederick R.....	265	Hinchinbrook Cape, Alaska.....	233	Ireton, H. J. C.....	356
Greenhouse, rotating.....	295	Hindhede, M.....	46	Iris, wild.....	335
Gregor Popa.....	120	Hisaw, F. L.....	21	Ireland, no snakes in.....	170
Gregory, William K.....	46	Hodge, W. S.....	254	Iron in brain cells.....	67
Grossmayr, Fred.....	84, 180	Hofeditz, W.....	199	Iroquois camp, Syracuse, explored.....	381
Gron Dahl, L. O.....	227	Hoffman, G.....	199	Irrigation, sand trap invention for.....	282
Gudger, E. W.....	105, 131, 277	Hogs, rice feed for.....	120	Islands, not from "lost Atlantis".....	408
Guie, Heister Dean.....	142	Holloway, J. K.....	79	Isle Royale Park, new.....	152
Gulf stream, temperature of.....	117	Holman, W. L.....	312	Ives, Herbert E.....	275
Gurin, Celia Z.....	216	Holmes, Arthur.....	163		
Gurin, Samuel S.....	236	Holtsopple, J. Q.....	117	Jackson, Hannah, medal.....	36
Gurney, R. W.....	199	Home, influence of.....	56	Jackson, James Allen.....	132
Gypsum cave remains.....	25	Home, ultra modern.....	324	Jaggar, T. A.....	239, 313
Gyro-stabilizer, 120 ton.....	248	Honey, 40,000-mile flight for.....	168	Japanese beetle.....	79, 376
		Hooton, E. A.....	71, 360	Japanese chestnut crop.....	168
Haan, Bierens de.....	329	Hoover, Herbert, Jr., research.....	377	Jayne, Horace H. F.....	201
Haardt, Georges-Marie, Asia expedition.....	344	Hooovers eat cheap meal.....	265	Jeans, James.....	3, 31, 339
Haber, Fritz.....	186	Hormone extract, cortin.....	88	Jepsen, Glenn L.....	40
Habits, repeating criminals have fixed.....	117	Hormone, male sex.....	205	Jersild, Arthur T.....	264
Hadley, Philip.....	6	Horned larks.....	159	Joffe, Joseph.....	104
Hadrian's wall surveyed.....	249	Horse fossils in Oregon.....	254	Johnson, J. H.....	264
Hafstad, L. R.....	19, 326	Horsetail.....	365	Johnston, J. B.....	328
Hagens, E. W.....	373	Horvath, A. A.....	260	Jones, D. Breese.....	46
Haines, W. C.....	316	Hoskins, R. G.....	300	Jones, Donald F.....	308
Hair color and emotion.....	295	Howard, L. O.....	127, 409	Jones, E. N.....	105
Hale, George Ellery.....	133, 291	Howe, Marion.....	15	Jones, Harold W.....	276
Hall, G. Stanley.....	91, 109	Hubble, Edwin P.....	52, 339	Jones-Cooper bill.....	62
Hamlin, H. E.....	297	Hueper, W. C.....	228	Josephine, E. M.....	168, 391
Hams Hall generating station.....	261	Huggins, William.....	395	Junker, Hermann.....	243
Handling device, bulk material, Booster.....	345	Hulbert, Henry S.....	282	Jupiter visible in February.....	85
Harger, Rolla N.....	212	Hulburt, E. O.....	278	Jupiter's moons, discoverer of.....	264
Hargrave, Lyndon L.....	287	Hull, A. W.....	42		
Harkins, William D.....	217	Human ant eaters.....	238	Kamp, Piet van de.....	31
Haroun-al-Rashid tomb, Persia.....	344	Humason, M. L.....	10, 151	Kapitza, Peter.....	169
Harper, Donovan.....	87	Humidity affects music.....	229	Karman, Theodor von.....	308
Harrington, M. R.....	25	Hunt, George M.....	9	Karnosh, Louis J.....	340
Harris, Frank.....	73	Hunting in the Ice Age.....	387	Karpman, Ben.....	232
Harris, R. H. T. P.....	233	Husband, Richard W.....	312	Kasanin, J.....	147
Hart, Parker.....	202	Hyde, Arthur M.....	56	Kassel, L. S.....	287
Hartford, C. E., Jr.....	73	Hydrogenation of oils.....	77	Kay, George F.....	89
Hartman, Frank A.....	88, 269	Hyslop, J. A.....	324, 357	Keane, M. Peter.....	291
Hartt, Constance.....	153			Kearney, Thomas.....	239
Harvey, R. B.....	4	Ice-Age glaciers.....	89	Kelly, A. R.....	174, 296, 339
Haslan, R. T.....	77	Ice-box.....	313, 333	Kelly, Clyde.....	45
Hassan, Selim.....	173	Ice crystals, huge.....	147	Kelly, Howard A.....	57
Hatfield, Henry D.....	138	Ice currents study.....	202	Kendeigh, S. Charles.....	24
Hawley, Estelle E.....	313	Ice defying flowers.....	281	Kennelly-Heaviside layer.....	5
Hay fever, cure for.....	367	Ice, fighting.....	69	Kenworthy, Marion.....	377
Headaches, migraine.....	220	Ice, one chunk for summer.....	333	Kettering, C. F.....	35
Health and shoulder blades.....	37	Iceberg expert on Pole flight.....	329	Kidder, A. V.....	22, 62
Health and temperament.....	309	Icebergs, scarcity of, 1931.....	318, 393	Kincer, J. B.....	90, 159
Health council, national.....	57	Icebergs, 310 forecast.....	218	King, J. L.....	79
Health level and evolution.....	151	Identical twins.....	26	Kinzel, A. B.....	232
Health record for 1930.....	121	Igloo no snow house.....	207	Kipfer, Charles.....	364
Health, revolutions cause poor.....	276	Illinois Indian site of 2,000 B. C.....	339	Kirklin, B. R.....	148
Hearing of frogs and turtles.....	312	Illumination unit, new Neon.....	83	Kish, jewelry excavated at.....	233
Heart disease test, new.....	213	Immortality, ancients' idea of.....	10, 216		



136	Klein, George J.	297	Lowell, Percival	85, 165	Meier, Norman C.	311
296	Kleitman, N.	300	Lubricant, synthetic	229	Melhouse, A. E.	22
109	Knight, J. L.	313	Lucas, Clement	26	Meltzer, H.	58
73	Knopf, Adolph	163	Luck, J. Murray	303	Memorizing methods	265
339	Knudsen, Vern O.	229	Ludendorff, H.	376	Memory	58, 200, 317
137	Knutti, R. E.	234	Lund, Frederick H.	269	Memory of non-living matter	148
79	Kober, S.	205	Lung disease like tuberculosis	36	Mendelian laws	43
201	Koehler, Wolfgang	329	Lungfish dies under water	102	Mendenhall, Charles E.	349
239	Kohman, E. F.	216	Lyot, B.	131	Menees, Thomas O.	71
325	Koppanyi, Theodore	8	M-Ray, yeast detects	63	Meningitis treatment, better	344
71	Korean electric project	89	MacCarty, William Carpenter	215, 269	Mental disease	67, 147, 312, 361
47	Kovarik, Alois	163	McClendon, J. F.	245	Mental efficiency and emotion	264
62	Krantz, F. A.	24	McCollum, E. V.	123, 164, 244, 291	Mental hygiene centers	132
250	Krieger, H. W.	68	McCrea, Adelia	206	Mental ills, due to environment	377
105	Kungur ice-caves	147	McDonald, Ellice	228, 294	Mental limp from forced righthandedness	136
200	Kunitz, M.	184	MacDougal, D. T.	20	Menu, low cost	265
406	Lacchini, A.	191	McFarland, Ross A.	266	Mercury from cinnabar	76
361	Lamson, Edna E.	328	McKern, W. C.	174	Mercury poisoning cured	409
300	Lane, A. C.	163	McLennan, J. C.	356	Mercury vapor electric generator	415
151	Lange, Bruno	227, 235	McMath, Francis	282	Merriam, John C.	62, 151
324	Lange, F.	403	McMath, Robert	282	Meryet-Amun, mummy of	28
313	Lantz, Edith	309	McQueen, H. S.	371	Mesopotamian tomb	4
148	Laqueur, E.	205	Maddox, Ernest E.	165	Metabolism, measuring	197
4	Larks, horned	159	Magic among cavemen	88	Metals hardened by magnetism	361
296	Larumbe, José	142	Magnesium, life essential	244	Meteor, Christmas eve	42
356	Larynx, artificial	373	Magnetic storms	291, 295	Meteorite, large African	152
355	Lashley, K. S.	14	Magnetism	28, 133, 169, 361	Meteors, Arizona, study	317
170	Latimer, Wendell M.	413	Magpie of Brazil	375	Methanol regulation	302
67	Lauer, A. R.	325	Maier, Charles G.	323	Methyl, uncombined	199
381	Laundry research, U. S.	149	Maitre, Abbé Le	23	Mexican drink contains yeast	104
282	Lauritsen, C. C.	327	Malaria germ to treat paresis	394	Mexican earthquake	56
408	Lawrence, E. O.	296	Malau bird	313	Mexico, races of	205
152	Layard, Austen Henry	346	Male sex hormone	205	Meydum, largest coffin at	215
275	Learning	87, 217, 265, 269	Man, age, dated by elephant teeth	276	Mice, desert, less thirsty	88
36	LeClerc, J. A.	254	Man, early, and sloth	25	Michelson, A. A.	52, 260, 297, 309
132	Left-handedness handicap	136	Mandrake, American	350	Migraine headaches	220
313	Leighton, M. M.	271	Manganese	153, 291	Miles, W. R.	217, 259, 309
376	Leipoldt, Johannes	214	Mann, F. C.	136	Milk protein, essential in	244
168	Lemnos excavations	152	Mann, William M.	138	Millar, Richard	292
301	Length standard fails	328	Mannerisms, annoying, of deaf persons	377	Miller, Harry "Indian"	287
339	Lenses, grinding	57	Manson, Grace E.	334	Miller, Mary L.	250
40	Leonard, S. L.	21	Manwaring, W. H.	409	Miller, W. A.	395
264	Lepers, 11, released from Carville	120	M-rbut, C. F.	218	Miller, W. Lash	340
104	Lepeschkin, W. W.	345	March snows helpful	186	Millikan, Clark	308
264	Lersch, J. A.	244	Marcowitz, J.	136	Millikan, Robert A.	3, 51, 211, 287, 327
328	Leukemia, serum for	228	Margarin, palm oil colors	38	Mineral oil preserves eggs	325
46	Liberia, diseases of	72	Maris, H. B.	278, 292, 295	Mines cheaper, safe	132
308	Life, artificial	20	Marius, Simon	264	Mines, preventing rock falls in	121
105	Life, artificial cells simulate	293	Marriage, failures, do not discourage	382	Mining potash in Texas	185
276	Life essentials, new	244	Marriage rate of widows	73	Minneapolis, forest remains in	10
62	Life rare in universe	339	Mars, "canals" of	85	Minot, George R.	15
391	Light absorption and stellar distances	31	Marsh, O. C.	203	Mirage, strange Atlantic	344
243	Light, efficient	202, 357	"Marsupial wolf"	307	Mishopsnow, Calif., excavations	269
85	Light-sensitive cell	227	Martel, R. R.	412	Mississippi game refuge	333
264	Light speed	260, 309, 396, 297	Martin, Lillian J.	181	Mixture of races	390
31	Light strange celestial	45	Martin, Samuel, Jr.	106	Molecules	35, 118, 362
169	Light with less power, better	83	Martindale, Phillip	169	Moles, E. J., Jr.	40
408	Lighthouse, Alaska, sliding	233	Mastodon, largest, found	87	Monkey clever as ape	329
340	Lily, malodorous	183	Maternity care	6	Monkey disease studied	109
332	Lincoln, E. A.	6	Maternity-infant welfare bill	62	Monroe, Day	179
47	Lincoln, humor, mental disease	372	Mather, Kirtley	62	Monstrosity, two-headed	7
87	Lind, S. C.	102	Mather, Stephen T., memorial	164	Montellius, Oscar	219
89	Lion-cub picture	193	Mathew, W. D.	254	Monument, new national	152
91	Lion hunting with airplanes barred	248	Mathias, O.	248	Moon	163, 282, 387
339	Lion, stone, in Palestine ruins	41	Matter, memory of non-living	148	Moonlight interferes with radio	5, 278
39	Lions of Nineveh	346	Matter, new unit of, sought	83	Moore, Carl R.	21
45	Liver, cirrhosis of	213	Matthew, W. D.	175	Moore, E. S.	344
57	Liver extract	8, 15, 77	Mauna Loa, Hawaiian volcano	239	Moore, Richard B.	72, 212
24	Livingston, Burton E.	23	May, Mark A.	233	Moore, T.	236
5	Livingston, M. S.	296	May-apple	350	Moral age measured	6
77	Locomotive, fast	35	Maya ruins inspected	62	Morgan, Thomas Hunt	43, 291
35	"Locust," no need for alarm over	357	Mayall, Nicholas U.	10	Mortality	6, 215, 383
62	Locust trees	399	Mayan nunnery	299	Morton, R. A.	236
59	Loeschke, Siegfried	207, 249	Mayas of Central America	58, 104	Mosby, Olav	202, 318
79	Loevenhart, A. S.	67	Mayas predicted eclipses accurately	376	Moses, Abram	263
32	Longevity inherited	351	Mayo, William J.	132	Mosquito of mixed sex	351
64	Lonke, Alwin	232	Measles epidemic reaches peak	360	Mossman, William G.	394
48	Loomis, A. L.	179	Medical education requisites	132	Motor, stroboscopic movies of	84
33	Lorenz, W. F.	67	Mees, C. E. K.	24	Moulton, F. R.	62
	Loughlin, G. F.	45	Meggers, W. F.	374	Mound building	109, 174
	Lovebirds spread parrot fever	121	Mehl, M. G.	24	Mouth in fish, cut makes new	105

Movie film, improved.....	105	Onnes, Kammerlingh.....	243	Pine blister war.....	164
Movie pioneer, memorial to.....	169	Onycholysis, loosening of finger nails.....	392	Pine, scrub.....	94
Movies, effect of.....	343, 383	Opera, whole, recorded.....	25	Pineapple tank, steel.....	170
Movies of sunset on moon.....	282	Opossum, mouse-size.....	255	Pirani, M.....	202, 357
Movies, stroboscopic.....	84	Optical laboratory, new.....	57	Pitcairn, H. F.....	323
Mules, gnats kill.....	329	Optical lenses.....	57	Pitcher plant.....	131
Multiple sclerosis treatment.....	398	Orchard disease in beehives.....	345	Planck, Max.....	195
Mummy, flowers date.....	28	Orchid greenhouse, new.....	295	Planet Eros close to earth.....	87
Munch, A. P. W.....	205	Oregon's "lost forest".....	217	"Planet," new, is asteroid.....	190
Munro, William B.....	51	Orent, Elsa.....	244, 291	Planets cause sun spots.....	5
Murlin, John R.....	313	Origin of earth theory.....	62	Plants.....	30, 57, 153, 201
Murphy, Edgar J.....	307	Osborn, Henry Fairfield.....	276	Plants and liver extract.....	8, 77
Murphy, James B.....	185	Oscillograph, rapid.....	21	Planimetric drop culture method.....	63
Mursell, G. R.....	117	Ostomislensky, Ivan.....	21	Plaskett, J. S.....	344
Muscular tension and sleep.....	261	Ostriches as food.....	213	Plasmoquine treats tropical disease.....	319
Museum budgets increase.....	409	Otter tease coyote.....	184	Pleasant words remembered.....	317
Museum, new botanical.....	57	Oxygen.....	90, 163, 266	Pleasure, women remember.....	58
Music, chemical.....	262	Oyster culture.....	137	Pluto discoverer honored.....	36
Music, humidity affects.....	229			Pluto picture.....	10, 41
Music, movement caused by.....	312	Pachacamac ruins in Peru.....	212	Pluto's size undetermined.....	413
Mushrooms, growth of.....	185	Palestine excavation.....	41	Podolosky, Boris.....	195
Mussels, tiny.....	40	Palm oil vs. butter.....	38	Point Barrow expedition.....	313
Mustard gas contest award not made.....	360	Panamanian bug.....	244	Poison for weeds.....	4
Mustard gas, defense against.....	186	Panda, rare giant.....	163	Poison gas, defense against.....	186
Muttowski, R. A.....	28	Paneth, F.....	199	Poison ivy and its remedy.....	414
		Paper, atmosphere affects.....	120, 238, 381	Poisoning, mercury, cured.....	409
Nabonidus, King, and Teima.....	54	Para-ethoxy-phenyl-thio-urea.....	249	Polar year, second.....	164
Nakamura, K.....	237	Paracelsus, the great.....	75	Follard, E. C.....	199, 266
Nakamura, comet or planet?.....	179	Paraffin, lubricant from.....	229	Polonium, structure of.....	266
Names, women scientists.....	89	Paralysis.....	56, 312	Popular Science monthly award, 1930.....	15
Narcotics.....	90, 190	Paresis, treatment of.....	394	Porter, Stephen.....	67
National Academy officers.....	291	Park, Orlando.....	248	Porto Rican art.....	68
National Park Bryce Canyon.....	40	Park, Everglades, bill.....	116	Pose, H.....	199
Nebuchadnezzar's court, jewelry of.....	233	Park, new Isle Royale.....	152	Post-glacial plants.....	30
Neal, John R.....	196	Parkin, J. H.....	297	Potash mining in Texas.....	185
Nebula.....	151, 392	Parking, new automatic.....	280	Potash plant, Italian.....	281
Nebula, Andromeda.....	339	Parrott fever in New York.....	121	Potassium and sugar cane.....	153
Nebula, 30 Doradus.....	250	Parshall, Ralph.....	282	Potato, sweet, superior.....	46
Nebulae composed of gases.....	395	Parsons, Charles A.....	410	Potatoes, better, from seed.....	24
Neely, A. W.....	229	Pasadena, athenaeum at.....	7	Powell, S. L.....	377
Nelson, Lyle.....	276	Paschal flowers.....	223	Powell mound excavations.....	73, 174
Neodymium, light from.....	276	Past, uncertainty of.....	195	Power from sunlight.....	227
Neon lights, improved.....	85	Paternity and eye color.....	189	Power from swift rivers, cheap.....	89
Nerves make muscle contract.....	392	Patterson, J.....	316	Precipitation of dust, electrical.....	283
Nervousness, cause of.....	340	Payon, Jose Garcia.....	115, 261	Prehistoric apartment discovered.....	366
Neujmin's comet sought.....	335	Pearl, Raymond.....	351	Prehistoric building booms.....	174
Neurotic's blood different.....	9	"Pearls" from cactus.....	25	Pressey, L. C.....	56
Newberry, Percy E.....	28	Pearse, A. S.....	25	Price, Dorothy.....	21
News, less crime, published.....	73	Pearson, Fred.....	309	Prince, Louise Aimé Augustin Le.....	169
Newspaper.....	137, 238	Pease, F. G.....	237, 309	Prince, John Dyneley.....	280
Niagara rock slide.....	68	Pecos, Indians of.....	71	Princess' guide to heaven.....	166
Nicaragua canal and earthquake.....	234	Pellagra.....	236, 280	Printing methods, new.....	202
Nicholson, Seth B.....	10, 291	Penguins.....	223	Pritchett, H. L.....	56
Nineveh, lions of.....	346	Pennock, G. A.....	181	Projector of depth pictures.....	275
Niuafou, strange bird of.....	313	Peptic ulcer patients high-strung.....	397	Protective coloration.....	47
Noguchi, Hideyo.....	234	Persia, bronzes from.....	39	Protective foods.....	123
Noise, avoiding airplane.....	79	Personality.....	232, 233, 406	Protein sensitivity.....	228
Noise proof house.....	330	Peru, holy city of.....	212	Proteins cause headaches.....	220
Noises, study of.....	377	Petit, Alexis Thérèse.....	230	Protozoa like mixed food.....	303
Non-living matter, memory of.....	148	Petrie, Flinders.....	233	Prythearch, H. F.....	137
Northrop, John H.....	184	Petrified wood, picture of.....	93	Psychoanalysis.....	361, 383
Norton, Arthur J.....	184	Petroff, S. A.....	359	Psychological tests.....	88, 119, 310
Nott, W. H.....	152	Petroleum, synthetic.....	102	Psychology aids business.....	106
Nucleus of atom, structure of.....	413	Pfahler, George E.....	396	Psychology aids cripples.....	165
Nutrition, sunlight increases.....	345	Pfund, A. H.....	227	Psychology of adolescence.....	91
Nutt, Arthur.....	265	Phillips, Frank M.....	73	Pueblo dwelling, prehistoric.....	287
		Phonograph record, new.....	25	Pueblo ruins in Utah.....	9
Oak blossoms.....	287	Phosphorus in fish blood.....	173	Pulque, food value of.....	104
Oaks and acorns.....	271	Photocells, hot.....	38	Purves-Stewart, James.....	312
Oberndorf, C. P.....	382	Photoelectric, sunmotor.....	235	Python and eggs.....	292
Obesity treatment.....	269	Photographic film, new fast.....	105		
O'Brien, Brian.....	163	Photographic type-setting.....	202	Quantum mechanics.....	195
Observatory, new earthquake, examined.....	394	Phthioic acid.....	41	Quantum theory and free electrons.....	349
Ocean depths, expedition studying.....	152	Physique and temperament.....	309	Quarantine law, ship.....	174
Ogburn, William F.....	22	Pianists vary time.....	319	Quartz, new light from.....	276
Oil.....	102, 117, 325, 403	Pic du Midi, observations at.....	131	Quetzalcoatl idol found.....	104
Oil pools, flies from.....	127	Piccard balloon ascension.....	364		
Oils, hydrogenation of.....	77	Pickering, Edward C.....	393	Ra Ouer excavations.....	89
Old age.....	181, 259	Pickering, W. H.....	10	Rabbit fever.....	57
Oleomargarin law amendment.....	164	Pictures, depth, projected.....	275	Rabbit serum for leukemia.....	228
Olitsky, Peter.....	234	Pierce, J. A.....	344	Rabbits, prehistoric, sought.....	408
Olynthus, "Greek Pompeii".....	191	Pigeon vaccine.....	44	Raber, Oran.....	8, 77



Race crossing in Mexico.....	205	Safety tests, toy used in.....	325	Smoke, fume and dust abatement.....	283
Races, mixture of.....	390	St. Eudokia icon.....	296	Smoot, J. M.....	243
Radiations from cells (M-rays).....	63	St. John, Charles E.....	52	Snails, big footed.....	56
Radio affected by moon.....	5, 278	St. Louis, East, excavation.....	296	Snake poison immunity, rattle.....	136
Radio and sunspots.....	185	St. Patrick myths.....	170	Snakes of Ireland.....	170
Radio forecast, 1931.....	40	Salt, sea, causes stains on hides.....	366	Snell, A. M.....	213
Radio laboratories, U. S.....	157	Sand, sea, floats in vegetable jelly.....	72	Snodgrass, R. E.....	246
Radio, transoceanic, antenna.....	117	Sand trap for irrigation.....	282	Snow, new scale measures.....	118
Radium.....	45, 150, 212	Sanford, John T.....	87	Social problems and individual.....	169
Radium authority dies.....	72	Sarcophagus, largest.....	215	Soil, electrically heated.....	255
Radium poisoning treated with viosterol.....	408	Savonius, S. J.....	330	Soil, mountain, more acid.....	264
Radium's effect on rats.....	135	Scales for weighing moving trains.....	381	Solar constant study delayed.....	345
Raffety bands studied.....	8	Scarface, Yellowstone bear.....	169	Soldan, C. E. Paz.....	276
Railroad tie, flexible steel.....	344	Scarlet fever epidemics reach peak.....	360	Soldering, silver for.....	106
Rainfall predicted.....	7, 170	Schmidt, Erich.....	201	Solomon's seal.....	303
Ramadanoff, Dimiter.....	38	Schmidt, William H.....	398	Sommer, Anna L.....	307
Rankin, G. A.....	103	Schoonover, Janetta W.....	294	Somner, H. Henrietta.....	281
Ransdell, Joseph B.....	164	Schuchert, Charles.....	163	Sound wave kills germs.....	179
Rashevsky, N.....	148, 293	Schwabe, Herrn Hofrath.....	267	Soybeans, ideal food.....	260
Rats, study of.....	14, 135, 216, 217	Schwartzman, Gregory.....	303	Space, star in.....	23
Rattler, portrait of.....	138	Schwassman and Wachman.....	216	Sparrow, song.....	182
Rattlesnake poison immunity.....	136	Schwenninger, Oskar.....	255	Specific heat.....	230
Raven, wooing antics of.....	88	Science advance forecast.....	22	Spectrum of rhenium painted.....	374
Rays, artificial, powerful.....	19	Science legislation in Congress.....	164	Speech, natural, given mutes.....	373
Reagan, Albert B.....	9	Science's progress revealed by literature.....	415	Speed measurements of old age vs. adults.....	259
Reddish, G. F.....	248	Scholarship and conduct.....	14	Speed record of rebula, new.....	151
Reduction studied.....	197, 297, 376	Schuler, Max.....	143	Speeding slows traffic.....	266
Redwood heart-rot.....	324	Scope, John.....	196	Spencer, R. R.....	157
Reese, Albert M.....	136	Scott, R. B.....	243	Sperti, George.....	94
Relapsing fever.....	109	Scouring-rush.....	365	Spider crabs.....	127
Relativity theory.....	51, 107	Scrub pine.....	94	Spider, fish-catching.....	131
Religious training and delinquency.....	117	Sea eagle eats mice.....	297	Spine, broken, man lives 38 years with.....	398
Renaud, E. B.....	366	Sea life depends on remote influences.....	399	"Spirits" and tipi-shaking.....	79
Reptile house, new.....	138	Sea sand migrations.....	72	Sponge reefs of midwest.....	280
Research, new, Herbert Hoover, Jr.....	377	Sea urchin, slate pencil.....	8	Spotted fever, fighting.....	157
Research, rest helps.....	216	Seaplane towing channel.....	355	Spring, 1931.....	180
Revolutions cause poor health.....	276	Seasickness, susceptibility to.....	330	Stagner, Ross.....	317
Rhenium spectrum painted.....	374	Seed-beds, electrically heated.....	255	Stalactite stolen from Wookey Hole cave.....	360
Rheumatism vaccine.....	237	Seidell, Atherton.....	236	Standard fails, length.....	328
Rice, F. C.....	118	Seismograph, automatic.....	389, 412	Stantial, Helen.....	340
Rice feed for hogs.....	120	Seismological stations needed in West.....	392	Star distance, new measure of.....	31, 232, 344
Richmond, Winifred.....	26	Seminole songs recorded.....	137	Star, four-in-one spheres.....	259
Ritcher, G. Holmes.....	275	Serums.....	228, 303, 344	Star rings from spinning.....	31
Rickets preventing food.....	94	Sex.....	58, 71, 269	Star Story.....	11, 85, 139, 221, 279, 341
Riddle, Oscar.....	328	Sex and gland secretions.....	21	Stars.....	393
Rieger, Frank J.....	277	Sex, mosquito of mixed.....	351	States, Charles G.....	345
Righthand training, forced.....	136	Shamrock identity disputed.....	170	Static in Yellowstone Canyon.....	105
Rinkel, Herbert J.....	220	Shandland, R. V.....	229	Steam turbine.....	410
Ritchey, George W.....	405	Shapley, Harlow.....	23, 31, 250, 317, 335	Steam whistle wasteful.....	42
Ritter, G. J.....	381	Shaw, Earl B.....	84	Steel, flexible, railroad tie.....	344
Roark, Ruric C.....	151	Shear, T. Leslie.....	10	Steenbock, Harry.....	184
Robber-fly.....	68	Sherman, Mandel.....	312	Stefansson, Vilhjalmur.....	207
Robert, George E.....	118	Shields, F. J.....	6	Sieggarda, Morris.....	205
Robert, H. B.....	62	Ship stabilizer, huge.....	248	Steinberg, Bernhard.....	392
Roberts, Regina Flood-Keyes.....	351	Shonle, H. A.....	265	Steiner, Paul.....	136
Robertson, Madge E.....	366	Shoulder blades and health.....	37	Steinmaurer, Dr.....	248
Robins, twin albino.....	373	Shrine, wayside, at Ur.....	121	Sternberg, C. M.....	8
Robinson, David.....	191	Shrubs follow disaster trail.....	249	Stethoscope tests metals.....	232
Rock of Gibraltar, air currents at.....	365	Shurupak excavations.....	201	Stetson, Harlan T.....	5, 40, 185, 278
Rocks, acid tells ages of.....	371	Shutts, L. W.....	35	Stevens, A. W.....	24
Rocky Mountain spotted fever.....	157	Siemens, Warner.....	227	Stevenson, George S.....	132
Rodents, luckless.....	63	Sight, loss of, equal to death.....	374	Stewart, Zella White.....	367
Roman helmet in Germany.....	72	Silva, Rafael.....	396	Stiles, George W., Jr.....	302
Roman sword found near Bremen.....	252	Silver for soldering.....	106	Sterling, Matthew W.....	47, 74, 325
Roman wall, camps along.....	249	Silver selenide.....	227	Stone Age dead mutilated.....	184
Romer, A. S.....	388	Silvette, Herbert.....	216	Stone Age, Egyptian settlement.....	243
Roos, Charles F.....	23	Sitter, William de.....	36, 156	Stone Age excavations.....	205
Roosevelt, Theodore.....	68, 163	16,000,000 volts produce x-rays.....	403	Stone darts weapons of the Ice Age.....	387
Root rot causes fever in plants.....	100	Skara Brae excavations.....	205	Stork triangle.....	200
Rorschach, Herman.....	147, 406	Skinner, C. A.....	57	"Stratosphere" layer studied.....	360
Rosen, H. R.....	345	Skinner, Laila.....	319	Stratton, G. M.....	295
Rowe, Allan W.....	137, 215	Sleep lack, effects of.....	261	Stroboscopic movies.....	84
Rubber tree seeds, oil from.....	117	Sleep requires brains.....	300	Stromberg, Gustaf.....	396
Rubber, vulcanizing.....	21, 194	Sloth and early man.....	25	Stromeyer, Friedrich.....	75
Rumford medal awarded K. T. Compton.....	355	Small, J. K.....	277	Strong Richard P.....	319
Rumreich, A. S.....	115, 157	Smilax, pest attacks.....	8	Strum, Ernest.....	185
Russ, Witten B.....	397	Smith, Edward H.....	218, 329	Struve, Otto.....	31
Russell, Henry Norris.....	275	Smith, Harlan I.....	201	Student's attitude important.....	87
Rythms, effect of, studied.....	312	Smith, Homer W.....	102	Students influenced by what "everybody thinks".....	380
S-rotor windmill.....	330	Smith, Hugh M.....	150	Sugar cane and potassium.....	153
Safety in mines cheaper.....	132	Smith, Margaret Cammack.....	308	Sugar, corn.....	56

- Sugar, fats changed to..... 313  
 Sulfur vulcanizing substitute..... 21  
 Sullivan, F. W..... 229  
 Sumeria, priest's statue from..... 281  
 Sumner, F. B..... 88  
 Sun and cosmic rays..... 248  
 Sun, atoms combine in atmosphere of..... 275  
 Sun, magnetism of the..... 133, 291  
 Sun prevents tetany..... 180  
 Sun radiation affects weather..... 99  
 Sun shadows, summer and winter..... 391  
 Sunburn, standards for..... 158  
 Sunlight..... 248, 345  
 Sunlight breaks comet..... 292  
 Sunlight, power from..... 227  
 Sun's corona, new study of..... 131  
 Sun's path across the sky..... 390  
 Sunset on moon, movies of..... 282  
 Sunspots..... 5, 40, 156, 185, 267  
 Superior, Lake, history..... 120, 344  
 Sverdrup, Otto..... 41  
 Sweden, ancient..... 219  
 Sweet potato superior..... 46  
 Symonds, P. M..... 14  
 Synchronized radio broadcasting..... 39
- Tai, En Shui..... 329  
 Talkie film improved..... 105  
 Tanis, H. E., Jr..... 229  
 "Tasteblindness" to bitter chemical..... 249  
 Taubenhaus, J. J..... 100  
 Taylor, David W..... 355  
 Teeth, fluoride causes spotted..... 308  
 Teima, modern city of..... 54  
 Telephone operator to give time..... 408  
 Telescope, big Canadian..... 24  
 Telescope, U. S. Naval Observatory..... 405  
 Telescope mirror, Ritchey's model..... 404  
 Tell Beit Mirsim excavations..... 41  
 Tell Billa, adjustable coffin at..... 4  
 Tema, modern Tiema..... 54  
 Temper and sleep..... 261  
 Temperament and health..... 309  
 Temperature record of Gulf Stream..... 117  
 Temperature research, low..... 169  
 Templeton, H. J..... 392  
 Tests, true, false..... 328  
 Tetany, preventing..... 180  
 Thenard and Gay-Lussac..... 171  
 Theophrastus..... 76  
 Thermit unit fights ice..... 69  
 Thermograph maps Gulf current..... 117  
 Thomas, William S..... 264  
 Thompson, Benjamin..... 355  
 Thompson, J. Eric..... 58  
 Thompson, Louis..... 42  
 Thompson, Warren S..... 181  
 Thomson, J. Herndon..... 299  
 Thorpe, W. H..... 127  
 Thunderstorms trouble night flying..... 396  
 Thurstone, L. L..... 343  
 Thylacine, rare animal..... 307  
 Thyroid unnecessary for reducing..... 269  
 Time, strict, not observed by pianists..... 319  
 Time, telephone operator to give..... 408  
 Timme, Walter..... 408  
 Tipi-shaking seance explained..... 79  
 Titmouse, tufted..... 15  
 Toad's eyes..... 232  
 Toadstools..... 382  
 Tolman, Richard C..... 23, 52, 195, 389  
 Tomb, Canadian Indian..... 201  
 Tomb, Egyptian, important..... 89  
 Tombaugh, C. W..... 36  
 Tongue of the ocean expedition..... 152  
 Tonsils may prevent diphtheria..... 404  
 Tooth, enamel of..... 357  
 Torrance, Edward G..... 294  
 Tortoise remains..... 250  
 Toucan: the magpie of Brazil..... 375  
 Toxin, new type of..... 303  
 Trachoma, germs may cause..... 234
- Traffic..... 63, 116, 266  
 Trains, moving, weighed..... 381  
 Transfusion, own blood..... 264  
 Trans-oceanic airship project..... 100  
 Triceratops remains..... 203  
 Trier, Germany, excavations..... 136, 207, 249  
 Trinitrobenzene vulcanizes..... 21  
 Trois-Freres cavern..... 88  
 Tropical disease treated..... 319  
 Troschin, W..... 147  
 Trout, weed "horn" kills..... 277  
 Trudeau, Edward L..... 359  
 Trumpler, R. J..... 31, 392  
 Trypsin, digestive power of..... 184  
 Tsetse fly trap..... 233  
 Tubercle bacillus..... 41  
 Tuberculosis..... 36, 329, 358  
 Tularemia in Canada..... 57  
 Tumors, new knowledge of..... 185  
 Tunnel, Pasadena airplane..... 308  
 Tupper, K. F..... 297  
 Turbine, steam..... 410  
 Turganinov, A..... 213  
 Turkey Creek Canyon excavations..... 366  
 Turkish, icon, old..... 296  
 Turtle, baby..... 179  
 Turtles, tone-deafness of..... 312  
 Tuve, M. A..... 19, 135, 326  
 Twins, alike and unlike..... 26  
 Tyler, J. R..... 234  
 Type-setting, photographic..... 202  
 Types, eight Indian..... 71  
 Typewriter found noisy..... 377  
 Typhoid, 1930..... 361  
 Typhus fever..... 14, 115
- Uher, Dyonis..... 202  
 Ulcer, peptic, patients high-strung..... 397  
 Ultraviolet radiations..... 94, 158  
 Uncertainty of universe..... 211  
 Universe, death of studied..... 3, 389  
 "Universe Maker" honored..... 156  
 Universe theories shaken..... 23  
 Ur, excavation of..... 25, 121, 213  
 Ur history extended..... 329  
 Urea, German store of..... 309  
 Utah ruins, early..... 9
- Vaccine prevents fowl pox..... 44  
 Vacuum tube..... 42, 101  
 Valencia, Francisco Cárdenas..... 104  
 Van 't Hoff, J. H..... 362  
 Varnish, new odorless..... 184  
 Vaughan, T. Wayland..... 399  
 Vegetable color, liver affects..... 77  
 Veo, Louise..... 147  
 Vestal virgins..... 298  
 Vibrations, molecular..... 35, 199  
 Villey, Pierre..... 245  
 Vine and fig tree..... 251  
 Viosterol for radium poisoning..... 408  
 Vitamin claims investigated..... 58  
 Vitamin D..... 94, 184, 212  
 Vitamins..... 236, 281, 329  
 Viteles, Morris S..... 106  
 Voice box gives natural speech..... 373  
 Voice, photograph of..... 21  
 Volcano eruption predicted..... 239  
 Vollrath, R. E..... 327  
 Volts, millions of..... 326  
 Voorhees, V..... 229  
 Vulcanizing process, new..... 21
- Wachmann and Schwassman..... 216  
 Wakefield, Lord..... 343  
 Walker, N. P..... 280  
 Ward, Melbourne..... 8  
 Warner, Lucien H..... 301  
 Warping wood, paint prevents..... 9  
 Washington elm, scion of..... 142  
 Waters, R. M..... 67  
 Watson, Walter, Jr..... 345
- Weather, affects of..... 84, 90  
 Weather cycles and forecasts..... 7, 277, 318  
 Weather, February..... 67, 159  
 Weather study..... 99, 316, 391  
 Weber, H. M..... 148  
 Weed, Arthur J..... 389  
 Weeds, poison for..... 4  
 Weeks, John R..... 313  
 Weisberg, Louis..... 202  
 Welding San Diego pipe line..... 168  
 Welty, Carl..... 41  
 West, R..... 15  
 Wetmore, Dr. Alexander..... 350  
 Wever, E. G..... 312  
 Whale skeleton found..... 121  
 Wheat from Russia..... 218  
 Wheeler, G. A..... 280  
 Wherry, Edgar T..... 281  
 Whipple, George H..... 15  
 Whistle, steam, wasteful..... 42  
 White, David..... 153, 291  
 White, William Charles..... 90  
 White pine blister rust..... 164  
 Whitehead, A. N..... 315  
 Whitman, W. G..... 135  
 Widing, Herbert..... 276  
 Widows, marriage rate of..... 73  
 Wilder, W. H..... 104  
 Wile, Ira S..... 136  
 Wilkins, Hubert..... 329  
 Williams, Herbert U..... 71  
 Williams, O. B..... 179  
 Willis, John E..... 216  
 Wilson, J. A..... 36  
 Wilson, J. W..... 8  
 Wilson, L. R..... 120  
 Wind tunnel..... 297, 308, 355  
 Windmill, new s-rotor..... 330  
 Windus, W..... 255  
 Winlock, H. W..... 28, 166  
 Winter garments..... 47  
 Wintergreen..... 110  
 Wisent, European hybrid..... 394  
 Withrow, Lloyd L..... 212, 238  
 Witt, Gustav..... 59  
 Woelcke, Karl..... 72  
 Wolf, Max..... 41  
 Women scientists to use maiden names..... 89  
 Wood, petrified, under microscope..... 93  
 Wood warping, preventing..... 9  
 Woodbury, A. M..... 56  
 Woods, F. H..... 219  
 Woodward, Gladys E..... 294  
 Woolley, C. Leonard..... 25, 121, 329  
 Work, women like their..... 334  
 Worms for destroying Japanese Beetle..... 376  
 Wu, Lu-Ch'iang..... 216  
 Wylie, C. C..... 42  
 Wynne-Roberts, Hugh..... 356
- X-ray apparatus, 800,000 volt..... 348  
 X-ray methods, improved..... 148  
 X-ray relieve baby's stomach obstruction..... 388  
 X-ray treatment for diseases..... 229, 404  
 X-ray wave length measured..... 294  
 X-rays..... 150, 327, 393, 404  
 X-rays produced from 16,000,000 volts..... 403
- Yale expedition studies ocean depths..... 152  
 Yeast..... 104, 340  
 Yeast detects M-Ray..... 63  
 Yellowstone, electric peak in..... 105  
 Yew, the Bowyer's tree..... 175  
 Youth and family influence..... 56  
 Yttrium and rare earths..... 314  
 Yuan, I-Chin..... 383  
 Yugoslavia, German colony in..... 280
- Zinc..... 75, 323  
 Zinsser, Hans..... 14  
 Zion Canyon snails..... 56  
 Zosaya, José..... 104



## ASTROPHYSICS

# Universe Not Running Down, Is Latest Hope of Science

Dr. Millikan's Retiring Presidential Address Before A. A. A. S. Traces Origin and Destiny of Physical Elements

HOPE THAT the universe is not running down and will not ultimately have the fate of a "heat death," with extinction of all its activity, was offered science by Dr. Robert A. Millikan, chairman of the Executive Council, California Institute of Technology and Nobel Prize Physicist, who delivered the principal address of the American Association for the Advancement of Science at Cleveland, as its retiring president.

After presenting his experimental evidence that the penetrating cosmic radiations are the signals coming to earth telling of the formation out of hydrogen of helium, oxygen, silicon, iron and other common elements in the intensely cold regions in the depths of interstellar space, Dr. Millikan suggested that "It may be that hydrogen is somehow being replenished there too from the only form of energy that we know to be all the time leaking out from the stars to interstellar space, namely, radiant energy."

This formation of the fundamental building block of all matter, the hydrogen atom, out of light and heat, is not a new idea. It has been advanced speculatively in the past, as Dr. Millikan said, "To allow the Creator to be continually on His job."

But recent advances in physics and astronomy, particularly investigations of the cosmic rays, offer a little more experimental hope that it is so. Dr. Millikan was careful to say, however, "It is not at all proved nor even perhaps necessarily suggested."

Referring to the contentions of Sir James Jeans, British astronomer, that the universe is dying, Dr. Millikan said further: "If Sir James Jeans prefers to hold one view and I another on this question no one can say us nay. The one thing of which you may all be quite sure is that neither of us knows anything about it. But for the continuous building up of the common elements out of hydrogen in the depths of interstellar space the cosmic rays furnish excellent experimental evidence."

The formation of hydrogen out of heat radiation is the "missing link" that must be demonstrated in order that the whole great universe will not in a distant future run down like a spent battery. That is why the idea is so interesting to scientists.

Dr. Millikan traced ten discoveries or developments made within the past hundred years which bear upon the question of the origin and destiny of the physical elements.

1. The discovery of the equivalence of heat and work and the consequent formulation of the principle of the conservation of energy.

2. The second law of thermodynamics, which is interpreted by some as necessitating the ultimate "heat death" of the universe, classically and simply stated in the Humpty-Dumpty rhyme. This led to the mediaeval theological suggestion of a deus ex machina to initially wind up or start off this running-down universe.

3. The discovery of the facts of evolution which showed that in the biological field at least the upbuilding from lower to high forms has been continuously going on for millions upon millions of years and is presumably going on now.

4. The discovery that the dogma of the immutable elements was definitely wrong. This came with the isolation of radium and other radioactive elements.

5. The discovery of the enormous lifetimes of the sun and stars, thousands and a half years, and the still greater lifetime of the sun and stars, thousands of times longer than the periods through which they could possibly exist as suns if they were simply hot bodies cooling off.

6. Development of evidence for the interconvertibility of mass and energy which suggested that the mass of the sun might be converted into radiant heat.

7. The discovery that all elements are built up out of hydrogen. This postponed the heat death of the universe at

least until all the hydrogen in the universe had been converted into the heavier elements.

8. Astronomers chafing under the time limitation thus imposed suggested that complete annihilation of positive and negative electrons within the atomic nucleus can take place, again extending the possible time span of this universe, this time a hundred fold.

9. Measurements by Dr. F. W. Aston, English physicist, on relative masses of atoms which supported Einstein's formula for the relation between mass and energy, showed atom building out of hydrogen and helium to be one of the two possible sources of energy other than the sun and the intensity of radiations that would be produced by atom building out of hydrogen and helium.

10. Discovery of the cosmic radiations which are evidences of the continuous building of the heavier elements out of hydrogen.

*Science News Letter, January 3, 1931*

A gateway has been erected at the site of Sir Walter Raleigh's colony in North Carolina in memory of Virginia Dare, first white child born in America.

A battleship takes on its food supplies, to the extent of about 100 tons, once a month.

## FIRST REPORTS

From major scientific gatherings held this week in four cities are presented in this issue of the Science News Letter. Additional articles will be published in the issue of January 10.

## The Meetings Covered Are:

### Cleveland—

American Association for the Advancement of Science and 50 associated organizations—throughout the magazine

### Toronto—

Paleontological Society—pages 8, 13

### Iowa City—

American Psychological Association and Archaeological Institute of America—pages 9, 10, 14

### Cambridge—

Society of American Bacteriologists—pages 6, 10, 14





#### A GOOD FIT FOR THE DEAD

Of old Mesopotamia was gotten in adjustable coffins like this one which was found recently at Tell Billa.

#### CHEMISTRY-HORTICULTURE

### Sure-Kill Poison Found For Troublesome Bushes

**A** POISON for undesired bushes such as poison ivy and European barberry, quick and sure in its action yet clearing out of the soil after its work is through, was described in Cleveland before the meeting of the American Society of Plant Physiologists by Prof. R. B. Harvey of the University of Minnesota.

This new agent in man's chemical warfare against tough weeds is ethylene oxide, chemically related to the ethylene chloride which has been found very effective in hastening the ripening of fruits and vegetables. Professor Harvey discovered the value of ethylene oxide during the course of experiments with various ethylene compounds. He found that the oxide killed the fruits and vegetables instead of speeding up their ripening processes.

He tried the compound on some large barberry bushes, which are being harried out of existence in the great grain areas because they harbor the black stem rust of wheat. What he calls "depth charges" of ethylene oxide dissolved in water were sunk into holes pierced in the soil at the roots. A few days later the bushes were revisited, and in every case they were found to be in the last stages of the death struggle. About one and one-half ounces of ethylene oxide, diluted out to a ten per cent solution in water, sufficed for a large bush.

At present barberry bushes are fought either by digging them up, which leaves stray roots free to sprout again, or by dumping common salt at their roots. "Depth charges" of ethylene oxide, Professor Harvey concludes, seem to offer the best means so far discovered.

*Science News Letter, January 3, 1931*

#### ARCHAEOLOGY

## Adjustable Coffin Found At Tell Billa in Mesopotamia

**A**N extraordinary coffin made in two parts so that one could slide partly into the other, thus adjusting the case to the length of the individual, is the newest discovery from old Mesopotamia.

The telescopic coffin, beautifully made of terra cotta, has been found by the joint expedition of the University of Pennsylvania Museum and the American School of Oriental Research, which is excavating at Tell Billa, in Mesopotamia.

The tomb in which the coffin lay was encountered some weeks ago, and when the archaeologists realized that it had not been disturbed it was pronounced a very valuable discovery. The tomb walls were built of stone and the entrance was bricked up. The fine earth which drifted into the tomb served to protect the sarcophagus and the objects lying around it.

The adjustable coffin in the tomb proved to contain only dust, but other objects were better preserved. Some fine bronzes were there, including an

elaborate apparatus for smoking hashish or some similar substance. Two elaborate candlesticks were at the head of the sarcophagus. With them were half a dozen vases, some little plates and a red beaker. The vases contained children's bones, it is reported. In the plates could be seen traces of foods no longer identifiable. The beaker was for water or some other drink.

Tell Billa, which today is a very large and imposing mound covering about thirty acres, was a place of habitation for thousands of years from about 4000 B. C. on into historic times. One of the summer palaces of the great Assyrian King Sennacherib who located at this place.

The tomb which has been explored belongs to a period after the fall of the Assyrian Empire. It is assigned to the fourth or fifth century B. C., when a line of Persian kings ruled that region until they were swept away by the conquests of Alexander the Great.

*Science News Letter, January 3, 1931*

#### CHEMISTRY

## Iodine in Paying Quantities Discovered in California

**I**ODINE, expensive and pungent-smelling chemical, has been discovered in paying quantities in southern California. This comparatively rare chemical element has long been controlled by a South American monopoly which regularly maintains a "pegged" world price on the commodity at a high level. Industries concerned with an iodine supply during possible future war blockade are much interested in the California prospects.

Some time ago Los Angeles petroleum chemists, analyzing brackish waters from oil wells near Long Beach, Calif., discovered iodides in commercial quantity. So great is the mass of worthless salts associated with the iodine, however, that difficulty has been experienced in extraction of the desired product. At least one company, however,

has attained some success with the problem, and California iodine is appearing on the market.

One of the favored methods of manufacture involves the treatment of the brine with nitrous acid which drives the iodine out of its salty compounds and permits it to be absorbed in activated charcoal much as war gases were caught in gas masks. Distillation of the loaded charcoal yields the precious product which commands about four dollars per pound.

Iodine holds a queer economic position in chemical industry. To be sure it goes into drugs, disinfectants, a few dyes, photographic supplies and a host of minor applications. Apparently nobody uses it in huge quantities, though very many persons require small quantities of the substance. Accordingly no

body is seriously embarrassed if a monopoly charges several prices for the supply. The South American producers could furnish a very much larger quantity than that now marketed, but prefer to restrict trade and charge a high toll.

Iodine has two inexpensive chemical brothers, chlorine and bromine, which have taken over most of the large-scale duties which manufacturers might well have assigned to the more expensive element. Iodine is a solid, rather than a fuming liquid like bromine, or a corrosive gas like chlorine. There are accordingly many situations where chemical manufacturers would find it superior in technical use. As long as iodine is a hundred times as costly as free chlorine, and fifteen times as expensive as bromine, it can hardly make much industrial progress.

*Science News Letter, January 3, 1931*

## RADIO-ASTRONOMY

## Moon's Position Thought To Affect Radio Transmission

**Astronomer Belives That Its Distance From The Meridian Is Associated with Height of Kennelly-Heaviside Layer**

**A**N apparent influence of the position of the moon in the sky upon radio transmission on the earth has been detected by Dr. Harlan T. Stetson, director of the Perkins Observatory, at Ohio Wesleyan University.

Speaking in Cleveland before the astronomical section of the American Association for the Advancement of Science, Dr. Stetson presented his hypothesis that the hour angle of the moon, that is, its distance from the meridian, is associated with the height of the Kennelly-Heaviside layer. This is the ionized layer in the upper atmosphere that is supposed to reflect radio waves downwards, and so make long distance transmission possible.

For some years Dr. Stetson has studied the reception of the carrier wave from a Chicago broadcasting station and has found good evidence of a connection between the transmission and the number of sunspots. He attributed this to differences in the height of the reflecting layer. Now his latest studies give evidence that the moon is also involved.

The main cycle of variation for sunspots is about eleven years, but Dr. Stetson's researches have shown a shorter one of about 15 months. He pointed out that this period corresponds closely with the recurrence of certain

arrangements of Venus and Mercury, thus suggesting a possible tidal effect.

He also stated that the maximum of the last sunspot cycle had occurred about July 1, 1928, while the last two months have shown the rise of a secondary maximum. This, he said, should be over in a few months, and by the end of 1931 spots will be fewer than since 1925. Also, this will mean an improvement in radio transmission. He said that last summer's time of minimum activity on the Sun had been associated with very good radio connections.

*Science News Letter, January 3, 1931*

## ASTRONOMY

## Suggests Sun Spots Due To Tidal Effect of Planets

**J**UST as the sun and moon produce tides on the earth, so does the gravitational attraction of the planets produce tides in the sun. These tides, in turn, are responsible for sun spots, in the opinion of Dr. Dinsmore Alter, professor of astronomy at the University of Kansas. Speaking in Cleveland before the astronomical section of the American Association for the Advancement of Science, Dr. Alter announced that he had secured a very close correlation between the computed numbers of sun spots and those actually observed. The chance of accidentally obtaining such a close correspondence between theory and fact is about one in thirty thousand, he declared.

*Science News Letter, January 3, 1931*

## ICHTHYOLOGY

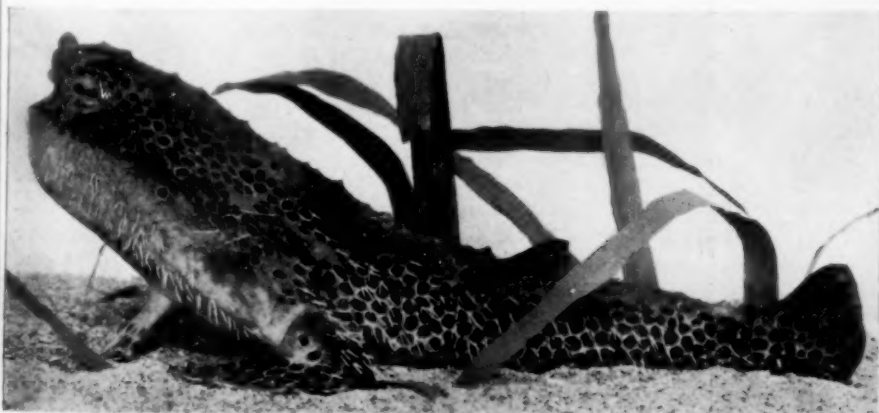
## A Fish That Walks On the Sea Bottom

**A** SPECIMEN of a fish that walks on the bottom of the sea is now on exhibition among the piscatorial exhibits at Field Museum of Natural History, Chicago. It is the batfish, a native of the tropical and semi-tropical seas of the Gulf of Mexico.

The batfish has many peculiarities. Looking down at it from above it seems to have a body like a toad, but with a fishy tail. Body and tail are covered with warts and a scanty growth of white whiskers. Looked at from the side, it appears to have four legs with finny feet, and these are additionally odd from the fact that the pair close together under the throat are the hind feet, while the forefeet or hands are far apart and set well back.

While it can swim with its tail, like any ordinary fish, the batfish usually walks or hops along the bottom in comparatively shallow places, according to Alfred C. Weed, assistant curator of fishes. In its hopping, Mr. Weed says, it moves exactly in the same way as a rabbit feeding on a lawn. The weight is rested on the forward pair of feet and the rear ones are brought ahead; then the weight is shifted to the rear pair and the forward ones moved along.

*Science News Letter, January 3, 1931*



**THE BATFISH**

A specimen of which is now on exhibition at the Field Museum of Natural History, Chicago, walks on the sea floor. It has hind feet where its front feet should be.

## BACTERIOLOGY

# New Invisible Chapter In Disease Germ Life Found

**Ability of Familiar Germs to Diminish in Size to Filterable State May Explain How Diseases Can Lie Dormant**

**A**N UNKNOWN chapter in the life of common disease germs, during which they are invisible through the most powerful microscope and so small that they slip through the finest filters, was announced to the Society of American Bacteriologists at Cambridge by Prof. Philip Hadley of the University of Michigan.

Cholera, typhoid, dysentery, diphtheria and other germs were shown by the experiments of Professor Hadley and his associates, to take on a filterable state of existence when roughly treated by chemicals, digestive fluids and unfavorable food. This new G type culture, as Professor Hadley has named it, differs markedly in form, growth, chemical and serum reactions from the ordinary types of the germ.

The consequences of this discovery made as the result of intensive work in Professor Hadley's laboratory since 1927 can not now be foreseen.

The germ of dysentery, known as the Shiga bacillus, which was the organism most thoroughly studied in the G type stage, was found to be non-toxic when rabbits were infected with its invisible stage. On the other hand, the bacillus in its invisible state was resistant to its usually effective enemy, the bacteriophage or "bacteria eater."

It seems probable that Professor Hadley has discovered a reason why diseases can lie dormant for a time and then later become dangerous. After the germ has been induced to take its G type existence, it propagates itself and retains the characteristics of its invisible form. But after some weeks of growth of the culture, the germ reassumes its common form. This indicated to Professor Hadley that his G type cultures are a real stage in the changing existence of the bacterial races.

The finest porcelain filters that can be made do not have holes small enough to separate the organisms of the young broth cultures of the new G type from the liquid in which they grew. Moreover, the filtrates and the cultures themselves when sealed up for more than

two years were alive and ready to produce the common form of germ.

Professor Hadley considers the filterable virus forms he has been investigating as comprising, at least in part, the bacterial microgonidia, which correspond loosely to reproductive cells or spores. These microgonidia are liberated from the cells and filaments of the germs at a certain point in their development.

Miss Edna Delves and John Klimek aided Professor Hadley in his research which was conducted in the hygienic laboratory of the University of Michigan.

*Science News Letter, January 3, 1931*

## PSYCHOLOGY

## Psychologist Measures Moral Age of Individuals

**Y**OU have been told that psychology can estimate how old you are mentally, and socially. Now comes a new yardstick: How old are you morally?

The new measuring scale was reported to the American Association for the Advancement of Science by Prof. F. J. Shields of the Connecticut College for Women and Prof. E. A. Lincoln of Harvard.

A child develops gradually in moral judgment until he reaches maturity, and in the average person this moral maturity is not reached until well over sixteen years, Professor Lincoln said in presenting the "tentative conclusions" of the investigation. That the word guilty has no meaning to a child under ten or eleven years of age, is one of the vocabulary facts that the two professors discovered when they probed into the moral understanding and attitude of people of different ages and different kinds of environment.

The effect of environment in shaping a child's attitude toward moral questions was clearly shown in the case of a little Italian boy of twelve years. This child ranked stealing as worse than

murder. When questioned, he insisted that was right, and showed that killing was taken rather as a matter of course in his neighborhood if affairs shaped seriously in that direction.

Many individuals grow faster mentally than they grow morally, so to speak, the investigation showed.

There is no evidence that the person who has a mature understanding of moral questions will act accordingly, the professors admit. The test is expected, however, to prove useful in studying the problem individuals who get into trouble in society and whose attitudes toward the world have to be studied in the courts, in clinics, and in schoolrooms.

*Science News Letter, January 3, 1931*

## ELECTRICAL ENGINEERING

## Pioneer Radio Work Brings Dr. Conrad Award

**P**IONEERING work in radio-telephone transmission before the days of broadcasting, and the building of an amateur radio telephone transmitter which resulted in the world's first broadcasting station, KDKA, have brought to Dr. Frank Conrad, of the Westinghouse Electric and Manufacturing Co., Pittsburgh, the Edison Medal, the highest award of the electrical engineers in the United States.

Announcement of this year's award, the twentieth to be granted, was made by the American Institute of Electrical Engineers. In addition to his developments in radio, Dr. Conrad has made important contributions to alternating current work and arc lamp design. He has been in the employ of the Westinghouse Company since 1890 and is now assistant chief engineer.

*Science News Letter, January 3, 1931*

## MEDICINE

## Maternal Care Saves Mothers and Babies

**M**OTHERS who have adequate care when their babies are born and during the months before and after have about three times as good a chance to survive as mothers in the same locality and circumstances who do not have this care, it appears from a statistical study made by Dr. Louis I. Dublin of the Metropolitan Life Insurance Co. Dr. Dublin reported the results to the Maternity Center Association in New York.



During a six-year period in the Bellevue-Yorkville district of the city, mothers who did not have the care of the association showed a maternal mortality rate of 6.2 or nearly three times as high as the rate for mothers who had that care, Dr. Dublin reported.

Of the 4,726 mothers studied, during a period of eight years, no woman under care died before her child was born. Only 11 died after the birth of the child, the deaths being from puerperal causes. The babies of these mothers have about twice the chance of being born alive that the average white baby has in New York City. Those born alive, have three times the chance of living beyond one month that the other babies of their district have.

While there is still room for improvement in maternal and infant mortality even under the regime of the association, the country as a whole can profit by the lessons of the association's work.

*Science News Letter, January 3, 1931*



THE ATHENAEUM

*At the California Institute of Technology, Pasadena, where Professor Einstein is expected to be a guest*

#### METEOROLOGY

## English Rainfall Predicted For Coming Decade

ENGLAND is due for a rainy time in the second half of 1932, the first half of 1934, the first half of 1935, and especially in the second half of 1937. In the latter year, the rainfall will average 43 per cent. more than the mean for nearly a century. On the other hand, English rainfall will be deficient in the first half of 1931, throughout 1936, especially the first half, the first half of 1939 and the second half of 1940.

These are the predictions of Dr. Dinsmore Alter, professor of astronomy at the University of Kansas, announced in Cleveland before a meeting of the American Meteorological Society. He has just returned from a year in England where he made his studies of periodicities in English rainfall.

Using the mathematical method known as a "periodogram," Dr. Alter has found eleven separate terms that vary periodically and affect the rainfall. Using these terms, and data that were available in 1925, he made predictions of the excess or deficiency of rainfall from then until 1930. The curves showing the predicted rainfall, and the actual observations, follow each other very closely. The predictions were made

after the years in question, but they could have been made in 1925, as the same material was then available.

Dr. Alter has continued these predictions to 1940. If these are as close to the truth as the 1925-1930 period, they should establish the value of his method.

*Science News Letter, January 3, 1931*

#### GENERAL SCIENCE

## Science Athenaeum Opened at Pasadena

WHEN Prof. Albert Einstein comes to Pasadena this month it is expected that he will visit the new Athenaeum of the California Institute of Technology at Pasadena.

In this \$500,000 building, just completed and opened this fall, Prof. Einstein will find congenial thinkers and fellow scientists. For the whole building is devoted to the social interests of the California Institute of Technology, the Mount Wilson Observatory and the Huntington Library and Art Gallery, to serve as a gathering place for scholars and visiting scientists, the staffs and

research students of these institutions. It has already a membership of 400.

The building, designed in Mediterranean architecture to harmonize with the other structures of the campus, has a spacious lobby, a large, beautifully appointed lounge, several small dining rooms and one seating 500 people. These may be thrown into one for important banquets, and adjoining them is a salon-hall known as the Hall of Associates, in which weekly lectures and demonstrations will be held as well as more social functions.

*Science News Letter, January 3, 1931*

#### BIOLOGY

## Two-Headed Baby Reported to Scientists

A BABY with two heads, that died as soon as it was born, was reported before the meeting of the American Society of Zoologists in Cleveland by Leo E. Buss of the University of Detroit.

A preliminary examination of the anatomy of this ill-starred little being showed that it was a sort of half-way stage between a normal individual and a pair of Siamese twins. It had two separate hearts and two stomachs. Two separate spinal columns rose from a single pelvis. On the mid-line of its body there was a third arm, containing a double upper-arm bone but only one bone in the forearm, where normal arms have two.

*Science News Letter, January 3, 1931*

## PALEONTOLOGY

**Dinosaurs' "Farthest North" Found in British Columbia**

THE "farthest north" of dinosaurs in the western hemisphere is represented by a large number of fossil footprints of these ancient animals recently discovered in the Peace River canyon, in British Columbia, at about 56 degrees north latitude. The find was reported in Toronto by Dr. C. M. Sternberg of Ottawa, at the meeting of the Paleontological Society.

Most of the tracks are preserved in ripple-marked sandstone or clay ironstone. They have been preserved throughout a vertical thickness of 400 feet. The longest trackway is over 100 feet in length and contains 33 tracks. Over 400 individual tracks, ranging from 6 to 25 inches in length, have been observed.

The tracks appear to represent five species, four of which were three-toed dinosaurs that walked on their hind legs only. The marks suggest that they had moderately sharp claws. The fifth species represents a quadruped dinosaur with four toes on the hind feet and three on the front. This animal seems to have been a plant-eater, and may have been an early form of the horned dinosaurs, whose highest development was reached many thousands of years later in Triceratops.

*Science News Letter, January 3, 1931*

## ASTRONOMY

**Astronomer Studies Composition of Comets**

NEW light on the astronomical mystery of just what constitutes the head of a comet is given by the researches of Dr. N. T. Bobrovnikoff, of the Perkins Observatory at Ohio Wesleyan University. He spoke in Cleveland before the meeting of the astronomical section of the American Association for the Advancement of Science.

His studies have concerned what are called the "Raffety bands," in the comets' spectra, so named after the physicist who first produced them in the laboratory. He has found that certain of these bands, that appear in the spectrum when analyzed through the prisms of a spectroscope, are due to molecules consisting of an atom of carbon combined with one of nitrogen, in the proportion in which they occur in the poisonous gas cyanogen. Other

bands, he believes, are due to molecules of carbon and hydrogen, a combination that does not normally occur in these proportions on the earth.

*Science News Letter, January 3, 1931*

## ENTOMOLOGY

**New Insect Pest Is Troubling Florida**

FLORIDA has a new insect pest. This time it is the minor but very profitable crop of ornamental asparagus, frequently marketed under the name of "smilax," that is the victim. At the meeting of the Entomological Society of America in Cleveland, Dr. J. W. Wilson of the Florida agricultural experiment station told of efforts being made to control an outbreak of cicada nymphs that are feeding on the roots of the asparagus plants in the territory around Jupiter, Palm Beach County.

This insect is related to the so-called seventeen-year locust and to the harvest-fly or dog-day cicada, common over wide stretches of the United States. The adults puncture holes in the stalks of the plants and lay their eggs in them. The tiny young that hatch from them drop to the ground, dig down until they find a root, and then attach themselves and suck sap until they are grown up and ready to emerge. Too many of them in a given area will damage plants severely by their parasitic habits.

*Science News Letter, January 3, 1931*

## PLANT PHYSIOLOGY

**Liver Extract Makes Plants Green**

LIVER extract, successfully used to check the course of pernicious anemia in human beings, has been used to check the analogous yellowing of plants placed in the dark, by Prof. Oran Raber of Immaculata College, Pa. Prof. Raber reported this research in Cleveland before the American Society of Plant Physiologists.

The activity of liver extract in checking this yellowing, or etiolation, of darkened plants, raises again the question of the possible physiological relationship between chlorophyll, the substance that makes leaves green, and hemoglobin, the stuff that makes blood red. Liver extract keeps red blood in the veins of the anemic, it now appears to keep green chlorophyll in the leaves of plants.

*Science News Letter, January 3, 1931*

**IN SCIENCE**

## MARINE ZOOLOGY

**Strange Sea Flowers Blossom on Reef**

See Front Cover

LONG ago some observant writer remarked that in the sea many of the plants look like animals and many of the animals like plants. Support for this view can easily be found in the strange sea urchin pictured on the cover of this issue of the SCIENCE NEWS LETTER. It grows on the Great Barrier Reef off the coast of Australia; the photograph of this specimen was supplied by Melbourne Ward, an Australian zoologist who has done much work in this naturalists' paradise of the antipodes. The species is known locally as the "slate-pencil sea urchin" because its thick spines are frequently used as natural slatepencils. More learnedly, it rejoices in the technical name of *Heterocentrotus mammillatus*.

*Science News Letter, January 3, 1931*

## PHYSIOLOGY

**Measures Circulation Rate By Injected Stimulant**

MEASUREMENT of the rate of circulation of the blood, one of the most difficult feats of physiology, has been accomplished in a new way by Prof. Theodore Koppanyi of Georgetown University medical college. Prof. Koppanyi demonstrated his method in Cleveland before the American Society of Zoologists.

The method consists in injecting into the large artery of the neck a small quantity of epinephrin, which has the effect, among other things, of causing the pupils of the eyes to enlarge. Very soon after the injection the pupil of the eye on the same side of the head, supplied by a branch of the artery, becomes dilated. After about seven seconds the pupil of the opposite eye also dilates. The interval represents the time necessary for the blood to pass from one side of the head through the veins, back to the heart, through the lungs and back to the heart again, and finally out through the systemic arterial circulation once more.

*Science News Letter, January 3, 1931*

# ANCE FIELDS

## ENTOMOLOGY

### Butterflies Taste With Their Legs

**B**UTTERFLIES taste with their legs, and their legs are 1,600 times as sensitive as the human tongue in detecting the sweetness of sugar.

These astonishing facts have been brought out by researches conducted by Almeda Anderson of the University of Minnesota, and reported in Cleveland before the meeting of the American Society of Zoologists.

Miss Anderson tested the reactions of 54 Monarch butterflies to plain water and to solutions of cane sugar and milk sugar. The legs of the insects were unresponsive to water and milk sugar solutions, but were very sensitive to cane sugar. They were able to detect concentrations of the latter only one sixteen-hundredth as strong as the weakest sugar solution a human being can taste.

*Science News Letter, January 3, 1931*

## GENETICS

### Chickens Bred Specially For Laboratory Tests

**B**REEDING chickens not for records in egg laying or speed in getting ready for broiling, but for use in the laboratory, is the unique task in genetic research undertaken by Dr. W. Franklin Dove of the Maine agricultural experiment station. Dr. Dove reported on his results in Cleveland before the American Association for the Advancement of Science.

The work of Dr. Dove has a very practical side. When dietitians or other physiological experimenters want to find out something about a new drug or food combination, they follow the ancient admonition and "try it on the dog"—or rabbit or rat or rooster. But chance-bred laboratory animals may not react evenly to the conditions under which they are placed. They may have inborn differences which will blur the record which would be clear and sharp if they were all really alike.

It was with the idea of getting some races of laboratory animals that would

be as much alike as possible that Dr. Dove began his breeding experiments. Now he has strains of chickens that always grow fast, others that always grow slowly; some that always get big, others that always stay small; some that always develop an abnormal skeleton, others that remain normal. There are a number of other characters thus contrasted in these physiologically reliable chickens. Now it will be possible to proceed with feeding experiments, with much more assurance of obtaining fully dependable results.

*Science News Letter, January 3, 1931*

## WOOD TECHNOLOGY

### Aluminum Paint Combats Warping Wood

**W**INDOWS that jam, doors that stick, airplane propellers warped out of balance and shape and the other annoyances and hazards caused by the shrinking and swelling of wood are best prevented by coating the wood with aluminum leaf or by paints, enamels, and varnishes containing aluminum powder, or by impregnating the wood with sugar, George M. Hunt of the Forest Products Laboratory of the U. S. Department of Agriculture states in a report based on 15 years of researches.

Since the early days of the war, when much trouble was caused by the warping of airplane propellers, government chemists have been working on this problem, which is important alike to housewife, engineer, and inventor. Under the stress of war necessity, the aluminum-leaf process was devised and since that time no more effective process has been discovered. Aluminum paints have, however, been investigated as a substitute and are now recommended by the Forest Products Laboratory in preference to the aluminum leaf for general use. Suitable paints and enamels are nearly as effective and much more convenient to apply.

The secret of the efficiency of aluminum leaf and the various paints, enamels, and varnishes in minimizing the shrinking and swelling of wood lies in their power to exclude moisture. Moisture permeating wood has a tendency to expand its volume and coatings reduced this tendency in proportion to their water-proof qualities.

All-metal plate, perfectly riveted and without cracks or airholes, offers the perfect coating but there is little practical use for this sort of armored wood.

*Science News Letter, January 3, 1931*

## ARCHAEOLOGY

### Ruins of Early Pueblo Age Found in Northeast Utah

**R**UINS of eleven little villages dating back to the very dawn of the Pueblo age have been found in the Ashley Valley, northeast Utah, by Dr. Albert B. Reagan, of the U. S. Indian Field Service. These are the first house ruins of such antiquity ever found in this region. A very few ruins of similar kind have been discovered in other parts of the Southwest, and it has been estimated that they were inhabited in the first centuries of the Christian era.

The villages examined by Dr. Reagan each contained from ten to twenty-five houses, and every house had been leveled. Fire had destroyed them, presumably as a result of enemy attack, he reported. The earth walls were all burned to consistency of brick, and the fallen, burned-clay walls now form a mound which marks the site of each lodge.

The houses built by these Indians almost two thousand years ago were circular earth lodges, Dr. Reagan said. The floor was of earth with a fireplace in the center. The base walls were partly of cobbles, and above these there seems to have been a lattice of wattle-work plastered over with mud. The roofs were flat and made of the same mud-daubed lattice. Some of the arrow points, the milling and hammer stones, fragments of undecorated gray pottery, and other lasting possessions of the ancient Pueblos were found still in the ruins.

Dr. Reagan came upon the ruins by chance while he was photographing ancient Indian rock carvings for the Laboratory of Anthropology at Santa Fe.

*Science News Letter, January 3, 1931*

## PHYSIOLOGY-PSYCHIATRY

### Blood of Neurotic People Differs From Normal

**N**EUROTIC individuals, who are over-sensitive, self-conscious, moody, apprehensive and diffident, have less calcium in their blood, more sugar, and less hemoglobin which makes blood red, than have non-neurotic people who are well-poised, self-confident, and sociable. This physiological difference between neurotic and normal persons was reported to the American Psychological Association, in Iowa City, by Prof. Elmer Culler of the University of Illinois.

*Science News Letter, January 3, 1931*



## BIOLOGY

## Remains of Buried Ice Age Forest Found

**R**EMAINS of a post-glacial forest that once stood on the side of modern Minneapolis were found recently during excavations for a new building, enabling scientists to go botanizing fifty or a hundred years ago. At the meeting of the Ecological Society of America in Cleveland, Prof. William S. Cooper of the University of Minnesota described the plant remains found in the deposit. The dominant tree at that time was spruce; in addition the organic remains represented other conifers, aquatic mosses and casts of a water-weed known as *Chara*, together with pond shells. The whole assembly, said Prof. Cooper, is strikingly similar to that found today in a morainic pond in southeastern Alaska.

*Science News Letter, January 3, 1931*

## ARCHAEOLOGY

## Graves At Corinth Show Greek Ideas of Immortality

**H**OW he has excavated a graveyard of the Greeks at one of their finest cities, Corinth, was announced before the Archaeological Institute of America, meeting at Iowa City, by Prof. T. Leslie Shear of Princeton. The oldest graves dated back to the Middle Hellenic period, 2000-1600 B. C., but

objects older than this, even pottery of the late Stone Age people of Greece, were found at the site.

Evidences of changing ideas of immortality were shown in this cemetery. In a grave of about 1000 B. C., a vase shaped like a pomegranate illustrated a Greek belief in immortality. The pomegranate, because of its seeds, was a symbol of fertility and resurrection.

In graves five or six hundred years later, the shell of a hen's egg replaced the pomegranate as a symbol of another life. By that time, the Corinthians

believed that the individual would continue to grow in the future world. The grave of a young boy contained a large helmet, and a small child's burial was accompanied by ten strigils, such as were used in rubbing the body in preparing for exercise.

No Greek objects later than the fourth century have yet been found at this cemetery, Professor Shear said. But Roman colonists later used the Greek cemetery, pushing aside the Greek burials to make room for their own.

*Science News Letter, January 3, 1931*

## ASTRONOMY

## First Pluto Pictures Made In Search For Similar Planet

**I**F ASTRONOMERS at the Mt. Wilson Observatory in 1919 had known just where to look on a set of photographic plates made then, the discovery of the trans-Neptunian planet, Pluto, would have been made eleven years ago. Actually the discovery was not made until last year at the Lowell Observatory, in Arizona.

Speaking before the astronomical section of the American Association for the Advancement of Science, Dr. Seth B. Nicholson revealed for the first time that the Mt. Wilson astronomers had themselves sought such a planet in 1919,

and, as it has now proven, they actually photographed it. The plates were taken by M. L. Humason, using a special photographic telescope with a ten-inch lens. The search at that time had been inspired by an article by W. H. Pickering, then of the Harvard College Observatory.

Last spring, after news of the discovery by the Lowell astronomers had been disseminated, and an approximate orbit of Pluto had been computed, they knew just where to look for the planet. Dr. Nicholson and his associate, Nicholas U. Mayall, examined the 1919 plates, and on four of them images of Pluto were found. Photographs of the planet were made this year with the great reflecting telescopes at Mt. Wilson, and from the positions given by the two sets of plates a highly accurate orbit of Pluto was computed.

These orbit figures show that Pluto's year is equal to 247.6872 terrestrial years, which corresponds to a mean distance from the sun of 39.45743 times the distance of the earth. As the earth's mean distance from the sun is about 92,900,000 miles, this puts Pluto at about 3,665,000,000 miles from the sun. However, the orbit of Pluto is quite eccentric. Now it is less than its mean distance from the sun, and is getting still closer. It will be closest, these figures indicate, on Nov. 6, 1930, at 5:20 p. m. Eastern Standard Time.

The Mt. Wilson astronomers have also computed the mass of Pluto and find that it is just about the same as the earth, perhaps a trifle more massive.

*Science News Letter, January 3, 1931*

## BACTERIOLOGY

## Growing Disease Germs Generate Electricity

**G**ROWING masses of deadly disease germs generate electricity just as real and effective as the output of the familiar dry cell that rings your door bell, Dr. Barnett Cohen of Johns Hopkins Medical School reported to the Society of American Bacteriologists.

Out of bacteria, some of the sort that cause diphtheria, dysentery and other ills, he has constructed what he calls a "bacterial battery" which furnished current of about two milliamperes at a pressure of 35 volts. This was built up of unit cells composed of a few teaspoonfuls of growing germ culture coupled to a sterile solution and from each small cell there discharged through 300

ohms resistance about a hundredth of a milliampere of electricity each minute.

Dr. Cohen did not suggest practical utilization of the relatively large amounts of electricity produced by the growing germs, but he explained that his studies are important because they throw light on the way bacteria grow.

"It is well known that bacterial growth is accompanied by a chemical reduction of the culture medium together with a loss of heat and the liberation of oxidation products, such as water and carbon dioxide," Dr. Cohen said, explaining that the bacteria growth can be measured by electricity produced.

*Science News Letter, January 3, 1931*

ASTRONOMY

# Orion Decorates January Skies

**Five Eclipses, Nearest Planet, and Many Returning Comets are Among Attractions for Astronomers in 1931**

By JAMES STOKLEY

SIX brilliant stars, arranged in a ring around a seventh, and with a planet, brighter than any, right in their midst; this group is the chief attraction that the month of January holds for the star gazer. Two other bright stars bring to nine the total number of first magnitude stars seen this month in the evening sky. Perhaps most conspicuous of all the constellations is Orion. In the mind's eye these stars become the heavenly warrior with a lion skin thrown over his left arm, and his right hand upraised, holding a club with which he is about to strike the charging bull, Taurus.

Look to the south this evening, if it is clear. High above the horizon are three bright stars in a row, not horizontal, but slanting down to the southeast. Above these three is a still brighter star, rather reddish in hue, and below them another, white in color. These are the most conspicuous stars of Orion. The row of three is the belt, and their names, reading from left to right, are Alnitak, Anilam and Mintaka. Like so many of the star names, these come from the Arabic. The first was originally Al Nitak, the Al being the article, and the phrase meaning, "the girdle." The third was Al Mintakah, and meant "the belt," while the middle was Al Nitham, "the string of pearls," perhaps referring to some imagined jewel in the warrior's belt.

The upper reddish star is the famous Betelgeuse, much brighter than the stars of the belt. It marks Orion's right shoulder, as indicated by its name, which has degenerated from the Arabic Ibt al Jauzah, "the armpit of the central one." Rigel, below the belt, marks Orion's left foot, which is raised as if he were climbing. Its name is also from the Arabic description, for it was originally Rijl Jauzah al Yusra, "the left leg of the central one." Almost directly above the belt is still another star, Bellatrix, which is not Arabic, but Latin, and means "the female warrior." Just why it should be thought of as feminine is uncertain, its Arabic title was Al

Najid, "the conqueror," and some writer translated it into Latin as Bellatrix. Perhaps he was some early advocate of the equality of the sexes.

From Orion as a guidepost, you can locate the other bright stars to be seen this month. Betelgeuse marks the center of the ring of stars, which we can start with Rigel. Above and to the right of Orion is Taurus, the bull, with the ruddy Aldebaran marking the animal's eye. As indicated by the first syllable, this is also Arabic, and means "the follower." That which it follows is a cluster of faint stars to the west of Aldebaran, and a little higher—the Pleiades.

## The Seven Sisters

These are sometimes called the seven sisters, though most people can only see six stars without some optical aid. With a small telescope, a pair of binoculars, or even a pair of opera glasses, many more come into view. The brightest of the group is Alcyone, only of the third magnitude. With its stars grouped together so closely, the Pleiades have attracted attention from the earliest times.

Aldebaran follows the Pleiades, and hence its name. Aldebaran itself is part of another sub-group of stars called the Hyades. These are not as close together as the Pleiades, but they form a rather conspicuous V-shaped figure, with the bright star near the apex.

From Aldebaran go a little beyond the zenith. There, almost overhead, is Capella, in Auriga, the charioteer. The name is Latin, and means "a little goat." This is because the charioteer was supposed to be holding a young goat, which the star represented.

From Capella we pass eastward to two bright stars, close together, with the lower star the brighter of the pair. These are the twins, Gemini, and their names are Castor, the upper star, and Pollux, the lower and brighter one. Only Pollux, rather orange in color, is of the first magnitude; his brother is a bright second magnitude star. The Gemini were favorite Roman deities, and two of the most famous and often pictured

of Roman ruins are the temples to Castor and Pollux at Rome and at Girgenti. The twins were the sons of Jupiter, their mother being Leda, the wife of Tyndarus, king of Sparta.

Passing southeastward from Pollux, we come to a bright yellow-white star which marks Canis Minor, the little dog. The star is Procyon, and the constellation is closely related to the last of our circle of bright stars, Canis Major, the great dog, right below Betelgeuse. In this group is the brightest of all the stars in the sky, Sirius, the dog star. The two dogs accompanied Orion, and the name of Procyon referred to the fact that he arose just before Sirius, thus "before the dog."

Every year at this time, the circle of six first magnitude stars, with Betelgeuse at the center, appears in the southern sky. But this month there is an added attraction. Between Betelgeuse and Pollux, nearer the latter, is another brilliant object. Its steady glow, brighter than any of the stars, shows that it is not a star, but a planet—Jupiter, the largest member of our own system of bodies that revolve around the sun. And if you had a powerful telescope, and were to look a little below Jupiter, and



The heavenly warrior, Orion, as represented in Johann Bayer's "Uranometria" (1603), the first star maps to use the modern system of designating stars by a Greek letter and the genitive case of the Latin name of the constellation.

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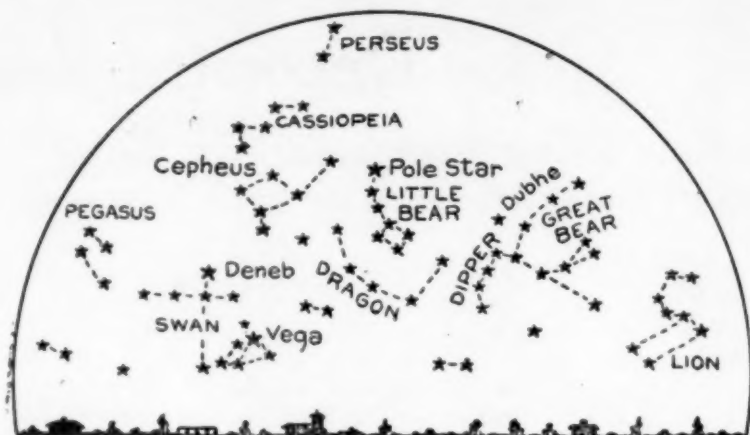
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WEST

NORTHERN SKIES IN JANUARY

EAST

still closer to Pollux, you could see Pluto, newest member of the solar system, the planet beyond Neptune. Only a year ago this month it was discovered by astronomers at the Lowell Observatory in Arizona, the third such discovery in modern astronomical history, and the first since Neptune was found in 1846. But it is of the fourteenth magnitude—much too faint to be seen except with a great telescope, and even then it appears only as a faint star. Only its rapid motion among the stars reveals that it is not one of them.

### Red Light Reveals Mars

Below Jupiter is another planet, red in color and not nearly so bright. This is Mars, brighter than any star except Sirius. Again, its steady light, so different from the scintillating brilliance of the stars, permits its easy identification. Still below Mars, close to the horizon, is another first magnitude star, Regulus, at the end of the handle of the Sickle, in Leo, the Lion. Close to Regulus is the planet Neptune, but like Pluto, it is only visible with a telescope. The ninth first magnitude star to be seen in the evening sky this month is over in the northwest. This is Deneb, at the top of the northern cross, more properly known as Cygnus, the swan. Deneb is close to the horizon, and most of the rest of the constellation is below, where Deneb follows a little later in the evening. This month astronomers are especially interested in still another object which is now in the constellation of Leo, and at the end of January will pass to the south into the neighboring group of Sextans, the sextant. This is the tiny planet Eros, and though it is only about 15 miles in diameter, and too faint to be seen without a telescope, it is now being observed more steadily than

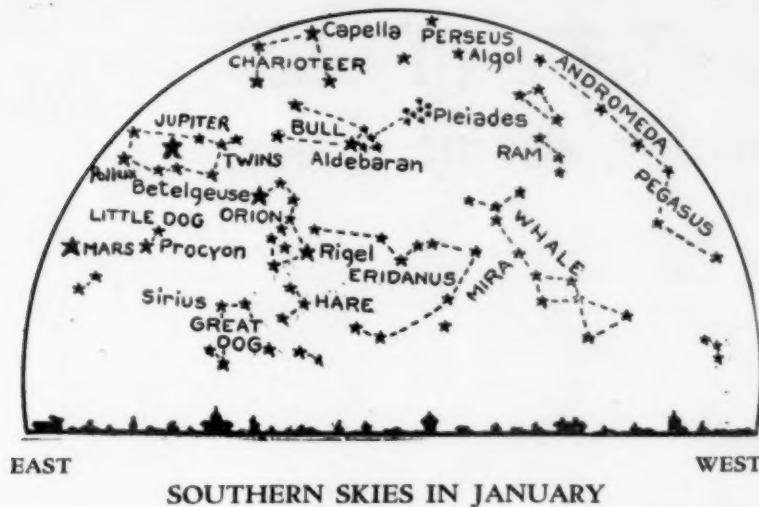
Jupiter, with all of its brightness and diameter of 85,000 miles.

Eros is important because its distance can be determined with high precision, on account of its close approach, and from its distance can be derived all the other dimensions of the solar system. For several months Eros will continue to enjoy the scrutiny of terrestrial astronomers. It will pass from the northern skies in a couple of months, and then the great telescopes of the southern hemisphere will be focussed on it.

Some other interesting events are scheduled for the year. Though astronomers can predict with considerable accuracy the future positions of known objects, one never knows when something new and important will be discovered. For example, the discovery of Pluto was the outstanding astronomical event of 1930, but few astronomers, except those at the Lowell Observatory, perhaps, ever suspected it was coming so soon. A careful survey of the ecliptic, the path of the planets, with a camera especially designed for catching a faint and possibly unknown planet, brought Pluto to light. This survey continues, and it is entirely likely that a new and trans-Plutonian planet may be found as a result. Then also, there is always the possibility that a bright comet may suddenly come into the sky, entirely unheralded. So far, the twentieth century has not maintained the average of bright comets set by the nineteenth. Perhaps this year may see one rivaling the famous comets of the past, some of which were conspicuous even in the daytime.

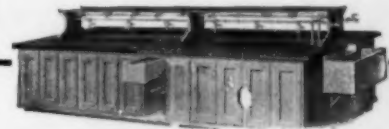
In addition, several periodic comets, that have been in the vicinity of the Earth before, will return. One of these is Encke's comet, which has a period of





SOUTHERN SKIES IN JANUARY

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3.3 years, and was last observed in 1928. It will probably be picked up by early spring. The comet known as Tempel III-Swift, because it was the third comet discovered by Tempel, and was independently found by Swift, may also return. It was discovered in 1869, and observed on three successive returns, the last in 1908. It has a period of 5.7 years, but since several returns have been missed, it may not be found this time. Neujmin's comet, discovered in 1913, and with a period of nearly 18 years, is also expected to make another visit. So is Schorr's comet, which has not been seen since 1918. Wolf's second periodic comet, discovered at the end of 1924, may also return, though it was only observed for a month at that time, and it was very faint and difficult to observe. Some of these comets may be completely missed, and it is quite certain that none will be bright enough to be seen without a telescope.

The year may also go down into history as one of a fine meteor shower. The Leonid meteors, which come every November, were more numerous in 1930 than they had been since 1901, and this may herald a really great shower in the next few years. November, 1931, may bring another, and even better, foretaste of what we may expect a little later. Then, of course, there are other meteor showers that are regular standbys. Of these, the Perseids, which come in August, are the most dependable.

Though 1931 will be a good eclipse year, considered by quantity, the quality will not be good. Five eclipses are coming, three of the Sun and two of the Moon, but none will be visible from the United States. The first, of the

Moon, comes on April 2. A couple of weeks later, on April 18, is one of the Sun, but it is only partial. The Moon will not completely obscure the Sun at any part of the Earth's surface, and so astronomers will make no particular effort to observe it. September 12 brings another solar eclipse, but it also is partial, and even smaller than the one in April. It will be seen from Alaska.

The second eclipse of the Moon, at which time the Moon enters the shadow of the Earth, comes on September 26, but it will not be seen from any part of North America. The third solar eclipse will come on October 11, and while it will be more nearly total than its two predecessors, it will also be partial. The people of southern South America, and the penguins around the south pole, will be able to see it.

*Science News Letter, January 3, 1931*

### PALEONTOLOGY

## Antelope Fossils Found In Southwestern Cave

**F**ossils of two extinct species of antelope, and of one antelope species still living, were found in Shelter Cave, 38 miles north of El Paso, Texas, Prof. Chester Stock of the California Institute of Technology reported before the meeting of the Paleontological Society in Toronto.

The existing species, which may be of slightly later date in the cave deposits, is the familiar pronghorn, which used to swarm in countless herds on the western plains and is still found in diminished numbers from Yellowstone National Park westward and southwestward into Idaho, Oregon and Nevada.

*Science News Letter, January 3, 1931*

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## EVERYDAY PHYSICS

By CARLTON JOHN LYNDE  
Professor of Physics, Teachers College,  
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#### IMMUNOLOGY

## Step Toward Typhus Fever Vaccine Taken

IMMUNIZATION against typhus fever, a filth disease that raised its head threateningly during the World War, is made a possibility of the future through the researches of Drs. Hans Zinsser and M. Ruiz Castaneda of the Harvard University Medical School, Boston, reported to the Society of American Bacteriologists in Cambridge.

Four important steps are made by the Harvard researches:

1. The Rickettsia bodies are shown to be the cause of typhus fever. These peculiar masses of irregular granules were found in cases of typhus fever by Dr. Howard T. Ricketts, who died a martyr to his research in 1910. For some time they were not even classed as true microorganisms. Now Dr. Zinsser has carefully washed the Rickettsia and by injecting these washed germs into guinea pigs has produced the disease.

2. Taking a hint from the tremendous mortality from typhus in times of

famine, Dr. Zinsser found that poorly nourished animals infected with the disease gave many of the Rickettsia bodies, although the organisms are rare in ordinary cases of the disease. This gave him a way of producing enough Rickettsia to attempt immunization experiments.

3. Using a vaccine made by killing Rickettsia with formalin, Dr. Zinsser immunized animals effectively. Sometimes the disease was prevented entirely and when this was not the case the disease was made much milder.

4. The experimenters succeeded in culturing the Rickettsia bodies, whereas this has been considered extremely difficult heretofore.

The Harvard researches have not yet approached application to humans.

Typhus fever is a disease of the unclean and if its carriers, such as lice, ticks and bedbugs, are prevented the disease does not appear in epidemics.

Science News Letter, January 3, 1931

#### ANIMAL PSYCHOLOGY

## Rats See When Visual Center In Brain Is Destroyed

NEW light was thrown on the problem of what part of the brain controls vision when Dr. K. S. Lashley, of the University of Chicago, reported the results of his experiments with rats to the meeting of the American Psychological Association in Iowa City.

Dr. Lashley found that rats can still see when the entire part of the brain known as the visual cortex is destroyed. They cannot distinguish differences in visual pattern, but can detect differences in brightness, and have some discrimination of distance.

He believes that his experiments indicate that the discrimination of intensities of light is a function of parts of the brain other than the cortex; the identification of the position of large objects is made possible by nerve fibers scattered to all parts of the cortex, and that vision for patterns or figures de-

pends upon a small cortical area which probably represents the projection in the brain of the retinal fixation point.

### Good Boys in School

The old charge that teachers' marks reflect personal reactions of liking and disliking toward the pupils as well as the pupils' achievement, has been tested by Prof. P. M. Symonds, of Columbia University, who reported to the Psychological Association.

There is a slight tendency, he found, for teachers to assign lower marks to pupils showing undesirable conduct than their achievement on objective tests indicates that they deserve, but there is also a definite relationship between achievement and conduct. The children with undesirable traits did the poorest work, while their better behaved classmates were more scholarly.

Science News Letter, January 3, 1931

ORNITHOLOGY

*Nature Ramblings*

By FRANK THONE



Tufted Titmouse

**T**HE little tomtit has been a funny bird ever since the days of Gilbert and Sullivan. Why Mr. Gilbert should have chosen this dapper little bird as the subject of his comically lugubrious ballad there is no telling. Possibly it was merely that the word "tomtit" looks rather funny per se. Or maybe the poet, with the humorist's flair for jibes at dignity wherever he finds it, was having his little fling at the bird's dapperness; for dapperness is the dignity of the small. However that may be, the little tomtit has had to sit on the bank of a river for a couple of generations, with a problematical tough worm in his little inside, singing a song that he never really sings.

For the song of the tomtit, or tufted titmouse as he is better known in this country, is not "tit-willow," but something that sounds much more like "peto." In some rural communities he is known as the "Peter-bird." In addition to his song he has another note which he uses when excited: "De-de-de-de," indefinitely; more or less like a chickadee scolding.

But there need be no mistaking him for a chickadee, though he is about the same size, for both sexes are ornamented with conspicuous head-crests, like the cedar waxwing. There need be no mistaking him for the latter bird, either, for he is much smaller, and lacks the conspicuous red and yellow markings on wings and tail. He is in general a gray-and-white bird, dark above and light below, in the orthodox fashion of so-called protective coloration, with a touch of warm red-brown on the sides to prevent monotony.

*Science News Letter, January 3, 1931*

A new rayon fabric resembling linen has appeared on the German market.

MEDICINE

## Two Scientists Divide Award For Conquest of Fatal Anemia

**F**OR their conquest of pernicious anemia by the feeding of liver to its victims, Dr. George H. Whipple of the University of Rochester and Dr. George R. Minot of the Harvard University Medical School were awarded jointly the Popular Science Monthly's first annual award of \$10,000 for the "current achievement in science of greatest benefit to the public." The selection was made by a committee of scientists.

Until Dr. Whipple discovered that liver was a powerful stimulator of the red blood cells that are lacking in pernicious anemia patients, and Dr. Minot applied this observation to human patients with life-saving results, pernicious anemia was a hopeless malady that killed in two to three years from the time the symptoms became obvious.

The success of the liver treatment for anemia was as marked as the use of insulin for diabetes, which a few years earlier had emphasized the importance of the internal glandular secretions in the body's mechanism.

Dr. Whipple did not apply to human beings his discovery of the effect of liver on blood cell formation, but Dr. Minot, who had been searching for an effective anemia treatment for several years, perfected the treatment clinically.

Dr. Minot's first patient was treated in 1924 but he did not announce his success until 1926. Physicians began to prescribe liver to their patients, thousands of lives were saved and liver that had been the "poor man's beefsteak" or used as dog food on account of its low price, skyrocketed in price.

### Concentrated Liver Substitute

But some people find it very difficult to eat half a pound of liver a day. For them a potent liver extract has been developed by Dr. E. J. Cohn, also of Harvard Medical School. The extract, however, is costly, and most of the sufferers must keep on with their liver diet.

Medical scientists, interested in the purely scientific as well as the practical problem, wanted to know exactly what it was in liver that was so effective in treating pernicious anemia.

Part of the answer has now been

given by Drs. R. West and H. D. Dakin and Marion Howe of Columbia University College of Physicians and Surgeons and Presbyterian Hospital, New York City. From liver they have isolated a crystalline salt which is active in pernicious anemia. Analyzing this salt, they found two chemicals, betahydroxyglutamic acid and hydroxyproline, which are probably fragments of the active material. How these two are combined in liver, and whether any other substances are combined with them has not yet been determined.

The practical application of this work is still in the future, but it seems possible that the synthesis of the active principle of liver may eventually be effected. When that has been accomplished, large-scale manufacture of a relatively cheap product may be expected.

*Science News Letter, January 3, 1931*



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## Physics

**GENERAL PHYSICS**—Wm. S. Franklin & G. E. Grantham—*Franklin and Charles*, 705 p., \$4. In this really admirable college text on physics, the authors have produced a work that should well succeed in their avowed purpose. This, they say, is to develop in the student's mind the logical structure, to train him in the use of instruments and the performance of ordered operations and to exercise him in "the application of these things to the phenomena of physics and chemistry at every step and all the time, with every possible variation." The problems are of particular interest, treating largely of actual scientific applications of the principles involved. A number of brief essays on physical topics scattered throughout the text give a spice to the whole.

*Science News Letter, January 3, 1931*

## Medicine

**TREATMENT OF EPILEPSY**—Fritz B. Talbot—*Macmillan*, 308 p., \$4. A concise review of present knowledge of a subject which has experienced recently a considerable revival of interest. Dr. Talbot describes both the ketogenic and dehydration methods of treatment. The book is for physicians, who will undoubtedly welcome it.

*Science News Letter, January 3, 1931*

## Evolution

**SONS OF THE EARTH**—Kirtley F. Mather—*Norton*, 272 p., \$3. Professor Mather has built himself a considerable reputation not only as a hardworking professional geologist but as a leading figure in the new humanism of science. This book carries on the good work, and will enhance his reputation in that field.

*Science News Letter, January 3, 1931*

## Botany—Horticulture

**AN ANNOTATED LIST OF PLANTS CULTIVATED IN SANTA BARBARA: CACTI AND OTHER SUCCULENTS**—Ralph Hoffman, E. C. Orpet, Eric Walther and James West, edited by Pearl Chase—*Garden Tours Committee, Santa Barbara*, 107 p., \$1.06. Other communities where the gardening spirit is well developed would do well to follow the lead set by Santa Barbara in making available for their citizens and for interested visitors such keys to the growing things to be found within their gates.

*Science News Letter, January 3, 1931*

## Entomology

**THE LIFE OF THE ANT**—Maurice Maeterlinck—*John Day*, 282 p., \$2.50. The cover-jacket announces this as "A work to stand beside *The Life of the Bee*"; it is just that. It is a litterateur's venture into entomology: a moderate amount of fact embellished with literary figure until it fairly scintillates. Often the author's enthusiasm leads him into anthropomorphisms to which we are all prone unless we watch ourselves, when we are dealing with the acts of other organisms. It should by all means be read, for it will give delight; but it should be read with a soberer book about insects always at the elbow.

*Science News Letter, January 3, 1931*

## Entomology

**ANTS**—Julian Huxley—*Cape and Smith*, 113 p., \$1.50. Julian Huxley has an advantage over Maeterlinck, who writes on the same subject. Mr. Huxley was born to a tradition of first-hand scientific research as well as vivid and convincing presentation, and in this small book he remains true to that tradition. He has enthusiasm, but his enthusiasm never betrays him out of the scientific state of mind. He has command of facts, and his enthusiasm serves as a leaven to prevent them from becoming lumped-up and heavy.

*Science News Letter, January 3, 1931*

## Entomology

**DEMONS OF THE DUST**—William Morton Wheeler—*Norton*, 378 p., \$5. We have here a book by a veteran entomologist who has achieved a distinctive, even a distinguished, literary style. This account of predatory insects that lurk in the earth is packed with facts, but they are not dry facts. The ant-lion is made as vivid as *Felis leo*, and even more ferocious. The whole book is at once a contribution to exact knowledge and to good literature.

*Science News Letter, January 3, 1931*

## Physics

**THE NEW PHYSICS IN EVERYDAY LIFE**—William D. Henderson—*Lyons & Carnahan*, 793 p., \$1.60. In this rather bulky high school text on physics the author has covered the essentials of physics with special reference to their applications. Thus it should arouse particular interest in the student, and this in turn is a help to the teacher.

*Science News Letter, January 3, 1931*

## Plant Physiology

**THE GREEN LEAF**—D. T. MacDougal—*Appleton*, 142 p., \$2. A veteran of American plant physiology here undertakes to give the general reader an understandable account of the basically vital processes that go on in the green leaves of plants. He succeeds in making those laboratories where all the food of the world is manufactured as much of an open mystery to his readers as would be the aisles of a packing-house or cereal mill through which they might be personally conducted. To this end the cleverly graphic illustrations contribute quite as much as the vivid text. The book is one of the Appleton New World of Science series edited by Watson Davis.

*Science News Letter, January 3, 1931*

## Geology

**CHAPTERS ON THE GEOLOGY OF SCOTLAND**—B. N. Peach and John Horne—*Oxford University Press*, 232 p., \$3.50. There is more geology per square mile in the British Isles than is to be found anywhere else in the world, and the rich complexity of the formations rises to a climax in Scotland, where the late Doctors Peach and Horne did their work. This volume forms a worthy monument to their memory.

*Science News Letter, January 3, 1931*

## Ornithology

**TO AFRICA WITH THE MIGRATING BIRDS**—Bengt Berg—*Putnam's*, 274 p., \$5. A noted Swedish naturalist tells of his ornithological travels most delightfully, and illustrates his pages with superb photographs obtained at the cost of many hours of cramped and water-soaked waiting. To read is to share his enthusiasm, and to be inspired to go and do in like manner.

*Science News Letter, January 3, 1931*

## Protozoology

**PROBLEMS AND METHODS OF RESEARCH IN PROTOZOOLOGY**—Edited by Robert Hegner and Justin Andrews—*Macmillan*, 532 p., \$5.50. This book is a symposium, its list of contributors including, besides the editors, such well-known names as Kofoed, Metcalf and Talliaferro. It will give the graduate student about to choose his road, and to the teacher who must direct him therein, a mine of useful information and fruitful suggestion.

*Science News Letter, January 3, 1931*